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Edited by

R. F. HARROD and E. A. G. ROBINSON

assisted by

R. C. O. MATTHEWS

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THE ECONOMIC JOURNAL

THE QUARTERLY JOURNAL OF THE ROYAL ECONOMIC SOCIETY

Edited by R. F. HARROD *and* E. A. G. ROBINSON
Assisted by R. C. O. MATTHEWS

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THE SIZES OF TRADE UNIONS: A STUDY IN THE LAWS OF AGGREGATION[1]

I. The Problem

1.1. It is well known that the distribution of the sizes of British trade unions is extremely skewed, with a large number of small unions at one end and most of the members concentrated in a small number of big ones at the other. In this respect unions resemble firms. This is not surprising: unions seem to grow in the same way as firms—some expand more rapidly than others, some shrink and die, some swallow others; new ones are created, big ones by amalgamations, small ones by fresh starts. The purpose of this paper is to apply to the concentration of unions the methods of inquiry which have already been applied to the corresponding aspects of the firm.[2]

1.2. Prima facie evidence for a marked increase in the concentration of British unionism is presented in Table I: in 1906 the six biggest unions held about a quarter of all members, in 1954 nearly a half. This change is the more significant because it has been accompanied by a rise in the proportion of the working population who belong to unions: so that in 1906 the six biggest unions contained less than 3% of the total working population, but in 1954 18%. Evidently, greater concentration may come about in various ways—by the disappearance of small unions, for instance, by the more rapid rate of growth of those that are already bigger, or by amalgamations, to name only some ways that spring to the eye. What has the actual way been?

II. The Form of the Distribution, and its Meaning

2.1. The question can be answered more easily if the sizes of the unions prove to be distributed on some principle. If we tried to draw a histogram for British unions in the usual way, and took a scale big enough to show the

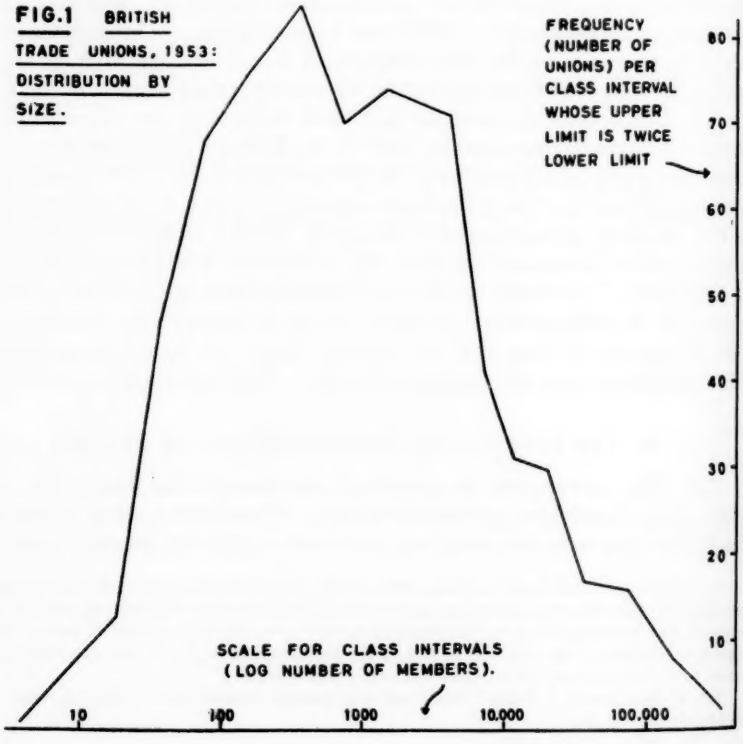
[1] The study of British trade unions in 1906, which was the starting point of the present inquiry, was made by Miss Marjorie Alderson, and the first tabulation of size distributions over the period 1906–53, and the fitting of log-normal functions to them, was carried out by Mr. F. Birch. We are especially indebted to the Ministry of Labour for the understanding and care by which the data which yield the statistical results presented were made available.

[2] P. E. Hart and S. J. Prais, "The Analysis of Business Concentration," J.R.S.S., 1956, Series A, 119, Part 2, p. 150.

TABLE I

Six Biggest British Trade Unions, 1906 *and* 1954

1906.	Members, 000's.	1954.	Members, 000's.
1. S. Wales Miners' Federation .	121	1. Transport and General Workers' Union	1,240
2. Amalgamated Society of Engineers	98	2. Amalgamated Engineering Union	823
3. Durham Miners	96	3. National Union of General and Municipal Workers . .	787
4. Amalgamated Railway Servants	70	4. National Union of Mineworkers	675
5. Yorkshire Miners	62	5. National Union of Railwaymen	372
6. Lancs and Cheshire Miners' Federation	55	6. Union of Shop Distributive and Allied Workers . . .	344
	502		4,241
7. 1,150 other unions . . .	1,620	7. 672 other unions . . .	5,254
8. All unions	2,122	8. All unions	9,495
9. Total working population, United Kingdom . .	18,720	9. Total working population, Great Britain . . .	23,610



detail of the smaller unions, we should need not feet of paper merely, but hundreds of feet, to complete the figure. But if we plot not the actual memberships, but their logarithms, then we get very nearly a compact and symmetrical figure of the normal kind. Fig. 1 illustrates this. What we have done, in effect, is to consider the proportionate instead of the absolute differences in the size of unions. Similarly, Table II has been compiled with the upper boundary of each class double the lower, so that all class-intervals are the same on a logarithmic or ratio scale. The resultant distribution is not exactly normal: how far it is so we discuss in the Appendix;

TABLE II

Size Distribution of British Trade Unions, 1906–54

From data supplied by the Ministry of Labour

Class.	Upper limit, no. of members.	1906.	1914.	1924.	1932.	1940.	1948.	1954.
A	3	—	—	3	3	1	—	—
B	5	1	—	5	3	4	—	—
C	10	4	4	23	27	17	1	3
D	20	32	25	37	43	28	11	11
E	40	96	79	88	89	88	41	41
F	80	182	147	137	137	129	68	60
G	160	237	215	154	147	119	85	68
H	320	159	188	151	121	114	95	73
K	640	115	141	158	124	120	83	86
L	1,280	119	147	109	95	93	81	68
M	2,560	68	109	96	90	73	66	73
N	5,120	64	55	82	74	74	75	66
O	10,240	35	67	57	58	61	37	39
P	20,480	21	36	40	33	28	34	35
Q	40,960	9	20	20	15	23	22	19
R	81,920	5	11	14	13	11	13	16
S	163,840	3	8	9	6	13	10	10
T	327,680	—	1	3	3	1	5	4
U	655,360	—	—	2	1	3	2	2
V	1,310,720	—	—	—	—	1	3	4
W	2,621,440	—	—	—	—	—	1	—
Total no. of unions:		1,150	1,253	1,188	1,082	1,001	733	678

sufficient to say here that except for the very small unions with less than 160 members, the distribution conforms closely with the normal curve. It does so, moreover, throughout a half-century in which the number of unions has fallen by more than a third, and the total membership grown more than fourfold. This is not of mathematical interest alone, but throws new light on the growth of the unions.

2.2. For one thing, it brings them into the wide class of distributions which are already known to take the log-normal form.[1] Not British unions alone, but those of some other countries belong to it: the 156 small unions

[1] J. Aitchison and J. A. C. Brown, *The Log-normal Distribution* (Cambridge University Press, 1957), especially Chapters 10 and 11.

of Iceland, for example, all but four of them with less than a thousand members apiece, in 1955; and, at the other extreme, the few and massive industrial unions of Germany and Sweden. But perhaps these last are log-normal not so much because they are trade unions as because they are coterminous with industries whose own sizes, as measured by employment, are themselves log-normal: of the 163 British industries whose sizes are reported for 1954,[1] those having up to 300,000 employees are closely log-normal, though the fourteen that are bigger do not conform. The sizes of British firms conform closely throughout the last half-century, despite many changes in composition and scale.[2] We know little about the receipts of individual wage-earners, but the British wages census of 1906–7[3] does

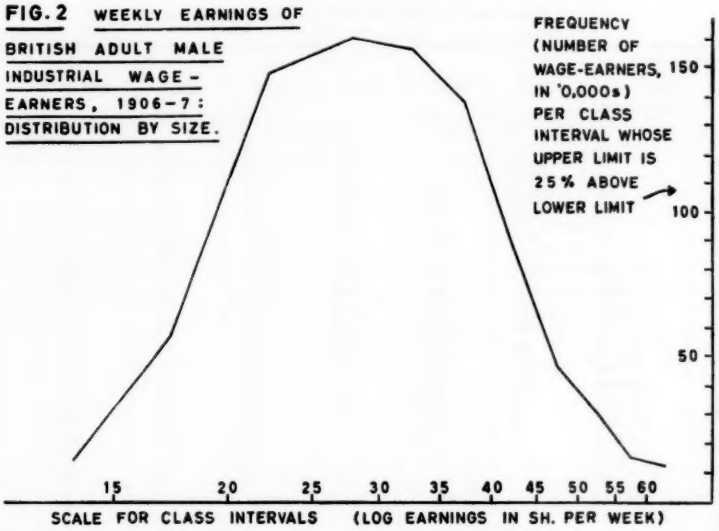


FIG. 2 WEEKLY EARNINGS OF BRITISH ADULT MALE INDUSTRIAL WAGE-EARNERS, 1906-7: DISTRIBUTION BY SIZE.
FREQUENCY (NUMBER OF WAGE-EARNERS, IN '0,000s) PER CLASS INTERVAL WHOSE UPPER LIMIT IS 25% ABOVE LOWER LIMIT
150
100
50
15 20 25 30 35 40 45 50 55 60
SCALE FOR CLASS INTERVALS (LOG EARNINGS IN SH. PER WEEK)

enable us to estimate the distribution of the earnings of nearly 7 million men: Fig. 2 shows this; it is closely log-normal for earnings of 20*s.* a week and upwards, but the number in the lowest class is greater than would have been predicted from the form of the main body. An explanation of the log-normality of earnings has been given by A. D. Roy.[4] Not a few other data of personal incomes are known to be distributed log-normally: those

[1] *Ministry of Labour Gazette*, February 1955, pp. 42–3.

[2] P. E. Hart and S. J. Prais, *op. cit.*, pp. 157–9.

[3] Board of Trade, Inquiry into Earnings and Hours of Labour: Cd. 4545 & 4844 of 1909; 5086 & 5196 of 1910; 5814 of 1911; 6053 of 1912; 6556 of 1913. There was also a report, not used here, on agriculture: Cd. 5460 of 1910.

[4] A. D. Roy, "The Distribution of Earnings and of Individual Output," ECONOMIC JOURNAL, Sept. 1950, pp. 489–505.

of personal fortunes, for instance, in Basle, in 1454 and 1887.[1] The populations of the towns in a country often appear to follow the same sort of pattern.[2] Thus the log-normal curve is a common form of the distribution of the sizes of economic and social aggregations, just as the normal curve of natural numbers, which we may distinguish as the absolute-normal, is found frequently in nature.

2.3. Mathematical argument, moreover, has given us the conditions that will generate the one as the other. Both kinds of distribution will be set up when the variate—a man's height or the size of a union, for instance—results from the action of numerous independent factors, each tending to make it a little bigger or smaller: the difference lies only in this, that if these factors tend to make the same *absolute* difference in all the variates on which each impinges, an absolute-normal distribution will emerge, whereas if the difference is the same *proportion* of the variates' sizes, the distribution will be log-normal. Two reflections arise. One is, how great a qualitative difference in the effect arises from a quantitative difference in the cause. The difference between adding so many members to all unions, great or small, and raising all memberships by so many per cent, does not look far-reaching: but it proves to make the difference between a relatively equal and compact society, and one of great disparities and diversity. If the tallest 5% of Englishmen bore the same relation to the modal height as the biggest 5% of British unions bear to the modal membership, they would be 336 ft. tall, and upwards. The absolute-normal distribution has a predominant middle class, in the sense that the central two-thirds of its members lie within a range of size that is about a third of the range of the whole; the range over which the smaller ones extend is just as wide as that which covers the bigger ones; and the average size of them all lies within the central two-thirds, and is also the modal size, the one that is most commonly found. In all three respects the log-normal distribution is strikingly different. Among the British trade unions of 1954, for example (Table II), the central two-thirds have from about 80 to 13,000 members, and that is only about 1% of the whole range of size. The smaller unions lie within a minute range, the bigger ones extend across a vast one. The average size, over 14,000, lies outside the central two-thirds, and is far greater than the commonest size, which is between 400 and 500. We might liken the absolute normal to a Scandinavian democracy, with relatively few better or worse off than the majority, and no extremes; the log-normal to an Asian despotism, old style, with the mass of the population at the subsistence level, and no defined middle class, but a smaller number of people holding most of the wealth, some of them immensely wealthy. It is to the latter type of distribution that our trade unions belong.

2.4. Here our second reflection arises. If the mathematicians' argument

[1] R. Gibrat, *Les Inégalités Economiques* (Paris: Sirey, 1931).
[2] G. K. Zipf, *Human Behaviour and the Principle of Least Effort* (1949).

means what it says, the concentration of great numbers of members within a handful of unions will have come about solely under a molecular bombardment, so to speak, by a multitude of independent factors, each tending to make unions grow or shrink by some proportion of their momentary size. This alone is enough: we do not have to invoke any economies of scale enabling a union to grow faster once it is over the hump; nor any acts of policy, such as amalgamation or empire-building. But it is contrary to a strong general impression to suppose that these last have not played an essential part. Can concentration have gone so far without them? We can answer in the light of the actual course of change among British unions in the last fifty years.

III. The Sources of Increased Concentration

3.1. That course of change is summarised in Table III. Here the whole span is divided into six periods, and for each of these we give the number, mean size and variance, in row 1, of all the unions in existence at its opening, and in row 6, of all in existence at its close. We give the same particulars, in row 2, for such unions as existed at the opening but ceased to exist, at least as separate bodies, before the close; and similarly in row 5 for such as were not present at the opening but came into existence during the period and were present at the close. (We have no record of those which both were born and died within the period.) The remaining unions were present throughout; we call them, in a somewhat conventional sense, the "survivors," and in rows 3 and 4 we give the same particulars for them, at opening and close. With this information we can now examine in turn some possible sources of the increase in concentration that Table I exemplified.

3.2. One such source might be thought to be simply the fall in the total number of unions, from 1,150 to 678: for the biggest unions might be expected to hold a greater proportion of the whole membership whenever they form a greater proportion of the number of unions. We check this in Table IV. Row 1 shows the proportion of the whole membership which we should expect the biggest six unions to hold, in 1906 and 1954, if the distributions of those years were exactly log-normal.[1] The agreement with row 2 warrants our using the same method to calculate the expected proportions in two hypothetical cases—suppose the variance was the same in 1954 as in 1906 and only the number of unions changed (row 3)? Similarly, suppose the variance was the same in 1906 as in 1954 (row 4)? The conclusion is clear, that the decrease in numbers by itself was responsible for only part of the rise in the measure of concentration used here—five or six percentage points only, out of some twenty-one. The dominant factor has been the rise in the variance.

[1] The method of calculating expected concentration ratios from observed σ^2 and N is explained in P. E. Hart and S. J. Prais, *op. cit.*, p. 160.

TABLE III

The Number, Mean and Variance of British Trade Unions, 1906–54

Units: N, no. of unions. $\bar{x}$ and σ^2, logs to base 2; since the upper limit of each class interval is double the lower (*e.g.*, Table II), the class interval in logs to base 2 is unity.

$\bar{x}$ gives the geometric mean size of union as a difference from an arbitrary origin at the mid-point of class K, *i.e.*, at $\sqrt{320 \times 640} = 453$ approx.: thus in row 1, 1906–14, $\bar{x} = -0{\cdot}83$ shows that the geometric mean size was $453 \div 2^{0{\cdot}83} = 255$ members approx.

	1906–14.			1914–24.			1924–32.		
	N.	$\bar{x}$.	σ^2.	N.	$\bar{x}$.	σ^2.	N.	$\bar{x}$.	σ^2.
1. All in initial year .	1,150	−0·83	6·35	1,253	−0·22	7·38	1,188	−0·25	9·33
2. Unions ceasing to exist during the period, sizes at initial year .	289	−2·28	3·55	479	−1·07	6·14	250	−2·00	6·60
3. Survivors, at initial year	861	−0·34	6·29	774	0·29	7·51	938	0·22	9·02
4. Survivors, at final year	861	0·11	7·85	774	0·63	8·54	938	−0·09	9·18
5. Unions coming into existence during period, sizes at final year .	392	−0·94	5·55	414	−1·92	6·46	144	−2·50	7·08
6. All in final year . .	1,253	−0·22	7·38	1,188	−0·25	9·34	1,082	−0·41	9·56

	1932–40.			1940–48.			1948–54.		
1. All in initial year .	1,082	−0·41	9·56	1,001	−0·15	10·12	733	0·65	10·03
2. Unions ceasing to exist during the period, sizes at initial year .	188	−2·03	6·91	351	−1·60	8·91	83	−1·48	4·66
3. Survivors, at initial year	894	−0·09	9·40	650	0·63	9·04	650	0·92	10·06
4. Survivors, at final year	894	0·00	10·21	650	0·78	10·47	650	0·86	10·48
5. Unions coming into existence during period, sizes at final year .	107	−1·68	7·04	83	−0·42	5·18	28	−1·14	6·27
6. All in final year . .	1,001	−0·15	10·12	733	0·65	10·03	678	0·77	10·47

TABLE IV

Expected, Observed and Hypothetical Proportions of Total Membership of British Trade Unions held by biggest six Unions, in 1906 *and* 1954

	1906, %.	1954, %.
1. Proportion expected on assumption that distribution is log-normal .	22	47
2. Actual proportion	24	45
3. Proportion expected if the variance had been same in 1954 as in 1906	22	28
4. Proportion expected if the variance had been same in 1906 as in 1954	42	47

3.3. How has this rise come about? We can try to separate the effects of various processes that could have contributed to it. The first is that of "births" and "deaths," of unions coming into existence, or ceasing to exist as separate bodies. This would evidently affect the variance if, for

instance, the " deaths " were of unions nearer the average size than the " births." But Table III shows that over most of the span there was little net effect of this kind. In three out of the six periods, it is true, the actual change in the variance, between all unions in the initial year and all in the final year, was substantially different from the corresponding change in the " survivors " alone: in two of these the " births " and " deaths " reduced the rise in the variance of the whole, in one they raised it. If we cumulate the increases in the variance of the " survivors " over the whole six periods, we get a total rise of 5·41, which compares with a rise of 4·12 (from 6·35 to 10·47) in the variance of the whole. Most of the difference came about in 1940–48, the only one of our periods in which the variance of the whole diminished, and it did so here only in consequence of the " births " and " deaths." In sum, the " births " of some unions, and the generally more numerous " deaths " of others, took marked effect to reduce the rise in the variance of the union world during the period of the Second World War, but at other times they worked now this way, now that, and on balance their effect was not substantial.

3.4. A second process that may have contributed to the rise in variance is amalgamation—roughly, when small unions amalgamate, the variance will be decreased, and conversely. Whatever effect there is might be marked, for we know of nearly 1,250 unions amalgamating within our whole span. Tables V and VI enable us to see what the actual effect has been. In Table V we collect all the unions that are known to have taken part in

TABLE V

Number, Mean Size and Variance of British Unions Amalgamating, 1906–54

Units: as in Table III

	Before amalgamation.			After amalgamation.		
	N.	$\bar{x}$.	σ^2.	N.	$\bar{x}$.	σ^2.
1906–14	205	−0·35	7·26	65	2·54	5·63
1914–24	458	0·26	8·93	121	3·11	7·77
1924–32	134	0·05	12·69	42	3·33	12·37
1932–40	104	0·74	13·30	36	3·97	9·19
1940–48	295	−0·48	14·13	48	4·25	11·35
1948–54	51	1·71	14·76	21	5·05	10·52

an amalgamation at any time during each period, and show their number, mean size and variance, taking them as they stood in the initial year; we then give the corresponding particulars for the group of unions which would have appeared if all the amalgamations had taken place at the initial year. We see that amalgamations were most numerous in the periods that included the two World Wars: in each of these about a third of all existing unions took part in amalgamations. We see also that amalgamations not only

necessarily raised the mean size within the group concerned, but raised it very greatly: in the first four periods it went up by about 3 of our units, *i.e.*, was multiplied by $2^3 = 8$, and in the last two the multiplier was more like 16. These rises of the mean invariably went with falls in the variance, and these, too, were sometimes substantial. But all this came about only in a segregated group: how much effect did it have on unionism as a whole? Table VI gives the answer. It shows, for the initial year of each period,

TABLE VI

The Effect of Amalgamations on the Mean Size and Variance of all British Unions

Units: as in Table III

	$\bar{x}$.		σ^2.	
	Before.	After.	Before.	After.
1906	−0·82	0·71	6·35	6·79
1914	−0·22	−0·01	7·38	7·96
1924	−0·25	−0·15	9·33	9·50
1932	−0·41	−0·37	9·56	9·71
1940	−0·16	0·25	10·13	9·66
1948	0·65	0·70	10·03	10·19

the actual mean size and variance, together with those we find if with a stroke of the pen we carry through all the amalgamations that actually came about during the period, giving them the memberships which the unions concerned actually had in the initial year. We see that amalgamation did tend to raise the mean size of all unions greatly—in fact, to multiply it by $2^{1.58}$ or about 2·9—in 1906–14, but in the other periods it contributed rises only of from 3 to 32%. Over the whole period it would have increased the mean size fivefold, if it had not been offset by the entry of new and small unions. But because we are primarily concerned with measuring concentration, our chief interest here is in the variance. It is no paradox that though amalgamation always reduced the variance of those unions alone that took part in it, in every period but one it raised the variance of unions as a whole: in a word, the participating unions came out more like one another but less like the rest. But the effect was generally modest: of the whole rise in the variance between 1906 and 1954, amalgamation on our way of reckoning would have contributed just a quarter. The main source must lie elsewhere.

3.5. We have seen, then, that "births" and "deaths" did little on balance to change the variance of the union world, and that though amalgamations did something to raise it, they leave some three-quarters of it unexplained. There remains a third possible process—simply that unions have grown at different rates, within their own skins, so to speak, and apart from amalgamations. This in turn might come about in two sorts of way. On the one hand, there might be a tendency for some particular kinds of union to grow faster than others; one form of this which can be statistically

TABLE VII

Transition Matrix of British Trade Unions 1948–54

Class, as in Table II	A.	B.	C.	D.	E.	F.	G.	H.	K.	L.	M.	N.	O.	P.	Q.	R.	S.	T.	U.	V.	W.	Sum, A–W.	Births.	Total, 1954.
A																								
B																								
C				1	1																	2	1	3
D				6	4				1													11		11
E					24	9	1	1														35	6	41
F					2	42	10	2	1													57	3	60
G						7	44	13	1			1										66	2	68
H							11	43	12	1	1											68	5	73
K								17	53	13												83	3	86
L									8	47	8	1		1								65	3	68
M										14	43	13										70	3	73
N										2	10	47	6									65	1	66
O												10	28									38	1	39
P													2	30	3							35		35
Q														2	16	1						19		19
R															3	12	1					16		16
S																	9	1				10		10
T																		4				4		4
U																			2			2		2
V																				3	1	4		4
W																								
Sum A–W				7	31	58	66	76	76	77	62	72	36	33	22	13	10	5	2	3	1	650	28	678
Deaths			1	4	10	10	19	19	7	4	4	3	1	1								83		
Total, 1948 .			1	11	41	68	85	95	83	81	66	75	37	34	22	13	10	5	2	3	1	733		

checked would be a tendency for bigger unions to grow faster than smaller ones. On the other hand, the chances of growth might be the same at any one time for unions of all sorts and sizes, but expansive influences would predominate in the sequence of impacts on some unions, others would pass under a mixture of expansive and contractive influences, and for others again the contractive would prevail. We might take a number of gamblers who all had the same chances, and all tended to win or lose the same proportion of their stake-money whether this was big or small: a run of play might still increase the disparity in their holdings, because some would have had winning sequences, others mixed fortune, others runs of losses. Can we rule out any of these possibilities, and so delimit the actual sources of the rise in variance? The attempt can be made by tracing the actual changes in the size of individual unions: this we have done, period by period, in the summary form that is illustrated by the matrix in Table VII, which shows the sizes of unions at 1948 and 1954. Here we see, for example, that in 1948 there were 68 unions in class F, that is, having between 40 and 80 members. Of these, 10 had " died " by 1954; of the remaining 58, 9 had gone down to class E, 7 had gone up to class G, and 42 remained in class F. As the geometric mean of each class is double that of the class below, a union that moves only from one class to the next has on the average halved or doubled its membership: it is remarkable how many such moves, and even bigger ones, occurred, when the framework of unionism was as stable as it had become by 1948. The materials of such matrices enable us to divide the observed change in the variance over each period between two components. We have [1]

$$V(x_{t+1}) = \beta^2 V(x_t) + \sigma_e^2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

Here the expression on the left-hand side stands for the variance of the logarithms of a variate at time $(t + 1)$, $V(x_t)$ being the corresponding variance at time t. β^2 is a regression coefficient whose value depends on whether there is in fact regression in Galton's sense: if small unions grow more rapidly than big, it will be less than unity, and there will be regression towards the mean, but if the big grow more rapidly than the small, there is progression, and β^2 will be greater than unity. σ_e^2 is the residual variance, and measures the deviations in growth about the average rate of growth, just as the variance at any one time measures the deviations in size about the average size.

3.6. Table VIII shows the results of fitting this relation to the matrices, like that in Table VII, for all six periods. It makes a clear impression. The regression coefficient has never been far from unity: that is, there has been little or no tendency either for unions far from the mean size to converge upon it, or for existing divergence to increase through big unions

[1] P. E. Hart and S. J. Prais, *op. cit.*, p. 172.

TABLE VIII

Changes in Variance of Logs of Sizes of British Unions over Six Periods between 1906 *and* 1954

	1906–14.	1914–24.	1924–32.	1932–40.	1940–48.	1948–54.
1. Regression coefficient. .	1·04	1·00	0·97	1·00	1·04	1·00
2. Standard error of (1) . .	±0·01	±0·01	±0·01	±0·01	±0·01	±0·01
3. Residual variance (standardised to 8-year period) .	0·98	0·87	0·72	0·81	0·63	0·64

growing faster than small; on the contrary, unions have tended to grow at the same rate whether they were big or little.

3.7. But the absence of differences correlated with size does not preclude differences of other kinds: in fact, these have been considerable, and the residual variance they have built up has been the main source of the growth of variance in unionism as a whole. They might be associated with characteristics of the union other than size: perhaps unions of the unskilled, for example, tend to grow faster than those of the skilled, or those drawing their members from one group of industries faster than those drawing from others. Our present information does not throw a direct light on this, and it would be interesting to study those unions which experienced high rates of growth, positive and negative, in order to establish the causes of the rise or fall in each particular case, and see whether there were any common features. But the fact that the actual distribution of the sizes of the unions agrees as closely as it does with the log-normal form provides indirect evidence that no one characteristic nor group of characteristics has been decisive, and that the actual influences on growth have been many and various. So we come back to the stochastic process, in which growth is the outcome of the impact of a large number of independent factors, each taking a small effect. But however differences in rate of growth have been brought about, we should expect them to be greater at some times than at others, for we know there have been some periods of turbulence, in which unions have waxed and waned rapidly and competition for members has been intense, and others when membership has been more stable. Table VIII agrees with this expectation. It shows the residual variance as lower since 1940 than in the inter-war years, and lower again than between 1906 and 1924.

IV. COMPARISON OF UNIONS WITH FIRMS

4.1. We have been treating the growth of unions as a particular process of aggregation, and tried to find why this leads to such great inequality, with a majority of the members grouped in a small minority of the aggregates. But we have remarked that in this respect the aggregation of capital or workers in firms presents the same sort of picture. Is the likeness close? Have unions and firms obeyed the same laws of growth? The already-

mentioned study of businesses quoted on the London Stock Exchange from 1907 to 1955 [1] enables us to give some answer.

4.2. There are striking similarities. The distribution of the capitals of firms is as substantially log-normal as is that of the memberships of unions. In both worlds the level of concentration has risen substantially: we cannot compare the absolute levels, because we lack data for the firms not quoted on the Stock Exchange, but we do know that the variance of those quoted rose by a third between 1907 and 1955. In both worlds, again, the rise in variance has owed little to changes in the total number of aggregates, or the composition of " births " and " deaths," or to amalgamations, but has been mainly due to the divergent rates at which aggregates have grown by themselves.

4.3. These similarities go with two differences of note. The reader may have remarked one already: the rise of a third in the variance of the quoted firms contrasts with one of nearly two-thirds in that of the unions. Thus concentration has increased more rapidly among unions than among firms. This difference came about largely in the ten years following the outbreak of war in 1939, when the firms showed a marked regression, the bigger firms growing more slowly and the smaller faster, and there was no such convergence among the unions. The other marked difference is that whereas a progressive fall in the residual variance has marked an increasing stabilisation of the rank order of the unions, there has been no such stabilisation among the firms, where rates of growth have continued to differ as much as ever they did before 1914—where indeed the residual variance has if anything tended to increase.

4.4. But the differences are less striking than the similarities: and here we may draw attention finally to the significance of the negative findings in which the two studies agree. Among neither unions nor firms, it appears, has increased concentration been mainly due to the events that take the eye —the amassing of territory by some empire-builder, the coming together of smaller aggregates to form some big amalgamation. Such happenings have their part in the movement of the whole, but are only a few out of the many forces at work. The drawing of so large a part of the whole subject-matter into a few big aggregations comes about mainly through the stochastic play of a myriad of factors, each with little effect by itself. The essential seems to be only that these factors should act multiplicatively rather than additively.

V. Summary

5.1. The distribution of all except the smallest of the British unions is closely log-normal. This places British unions in a wide class of social aggregations of similar inequality and concentration (2.2). To generate the

[1] P. E. Hart and S. J. Prais, *op. cit.*

striking characteristics of such distributions, it is enough that the sizes of the aggregations composing them should depend on a large number of independent factors, each of which tends to change all the aggregations it acts on multiplicatively and not additively (2.3, 2.4).

5.2. The rise in the degree of concentration of British unions, as measured by the variance, has owed little to the decline in the total number of unions (3.2) or to " births " and " deaths " of unions (3.3); and only a quarter of it can be ascribed to amalgamations (3.4). Most of it has been due simply to differences in the rates of internal growth of the unions.

5.3. Study of the matrices which summarise changes in the size of individual unions period by period (3.5) suggests that these differences in the rate of growth have not arisen from any systematic tendency of big unions to grow faster or slower than small (3.6), but from the chance concentration of predominantly expansive influences upon some unions, and contractive upon others, out of the many and various influences that play on all. The extent of these differences has progressively diminished since 1914 (3.7).

5.4. Unions resemble firms in Britain in the last fifty years in that the sizes of both are approximately distributed log-normally, and the variance of both has risen, mainly through divergent rates of growth (4.1, 4.2). But among the firms the rise in variance from end to end has been smaller, though the differences in rates of growth have not diminished as they have among the unions (4.3). Remarkable in both is the comparatively small effect that conspicuous acts of policy have had in increasing concentration (4.4).

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APPENDIX

The Fit of the Log-normal Distribution to the Sizes of Trade Unions

A.1. The goodness of fit may be judged by inspection of the kind of regression illustrated in Fig. 3. This applies Gibrat's procedure,[1] which is equivalent to plotting on log-probability paper.

A.2. It will be seen that the observations for unions of 160 members and upwards lie fairly closely about a straight line, but this line does not fit the observations for the very small unions, which include too small a proportionate frequency to lie along it, but seem to follow another line of regression of their own. A similar break, at about the same size of union, occurs in all the distributions that have been plotted in this way, over the fifty years.

We can also test the fit by calculating Fisher's g_1 and g_2. The results appear in Table IX. If the fit were exact the values of both would be zero: it will be seen that although the deviations are small they are statistically significant. In particular, g_1 shows slight positive skewness: the very small unions are fewer than

[1] *Op. cit.*, p. 54.

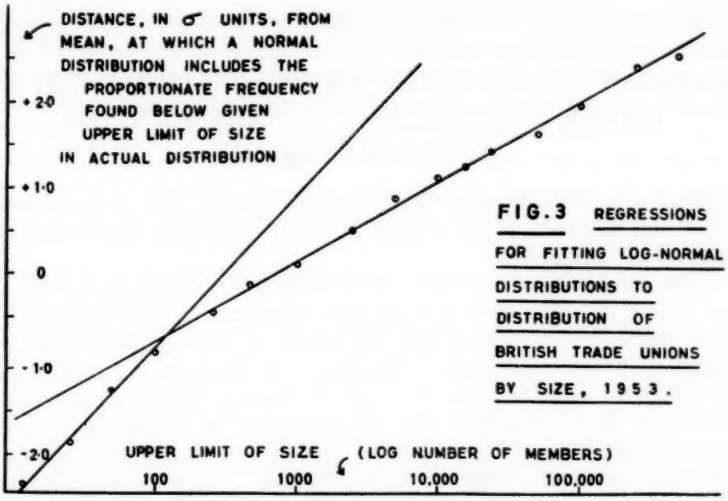

FIG. 3 REGRESSIONS FOR FITTING LOG-NORMAL DISTRIBUTIONS TO DISTRIBUTION OF BRITISH TRADE UNIONS BY SIZE, 1953.

TABLE IX

Measures of Deviation from Log-normality of Sizes of British Trade Unions

	g_1 (skewness).	g_2 (kurtosis).
1906	0·70 ± 0·07	0·18 ± 0·14
1914	0·61 ± 0·07	0·01 ± 0·14
1924	0·42 ± 0·07	−0·02 ± 0·14
1932	0·41 ± 0·07	−0·20 ± 0·15
1940	0·50 ± 0·08	−0·09 ± 0·15
1948	0·59 ± 0·09	0·10 ± 0·18
1954	0·47 ± 0·09	−0·08 ± 0·19

they would be if they conformed with the course of the distribution that fits the larger unions.

A.3. The deviation of the smaller unions observed in these two ways prompts the suggestion that the actual distribution is a composite of parts of two log-normal distributions—we might speak of a log-binormal form. In favour of this are the consistency of the break noted in A.1 and the closeness of the fit to each regression line in its own region; and we might add the explanation, that generally unions having less than about 160 members will not have branches as the bigger unions do, so that they constitute a different species of union. As against this, the transition matrices do not suggest any obstacle to unions moving back or forth across the class boundary at 160 in the same way as across other boundaries.

A.4. Since the log-normal form is generated when a *given* number of quantities are subject to change, there is a difficulty in applying it to the actual world of unionism, in which the number of unions has changed greatly, and unions have not merely grown or shrunk, but in large numbers have come into existence and gone out of it altogether. But the " death " of one union may be a condition of the " birth " or expansion of another; and, in general, " births," " deaths," expansion, and contraction may all alike be paths of the process by which the total number of members and their distribution between unions are changed from time to time.

MARXIAN HYPOTHESES AND OBSERVABLE TRENDS UNDER CAPITALISM: A "MODERNISED" INTERPRETATION[1]

USING a modern Western analytical framework, this note attempts to express and to examine the crucial Marxian hypothesis concerning future trends under capitalism.

Marx expected unfavourable trends in both wage-rates and profit-rates, even though he anticipated a rapid rate of increase in technological knowledge. Some classical writers also had expected unfavourable secular trends in wage-rates and profit-rates. Moreover, in passages the significance of which for the interpretation of classical views is doubtful, the fear had occasionally been expressed that the character of technological progress might turn out to be too labour-saving, and thus technological advance itself might exert an adverse influence on *wage* trends. But so far as *profit* rates are concerned, the classical literature typically regarded technological progress as an offset to diminishing returns. In the classical analysis, even in that of relatively pessimistic writers, unfavourable profit trends would have been the result of the quantitative insufficiency of this offset in the face of a gradually mounting pressure of diminishing returns (and, on the whole, classical expectations concerning wage trends were also more optimistic for strongly progressive phases of development with rapid technological advance than for stationary conditions). In the Marxian system, on the other hand, technological progress *does not essentially play the role of an offset* to diminishing returns. This is because *technological progress here is considered inseparable from processes by which it is accompanied and which it sets in motion, processes which Marx expected to lead to a downtrend in profit rates as well as to very unfavourable wage trends.*[2]

What assumptions do we have to "feed" into an analytical apparatus of the present-day Western variety to arrive at Marxian conclusions? What alternative assumptions give a better explanation of trends that have been observable in advanced Western economies?

(1) For the sake of illustration we shall write a production function of the Cobb–Douglas type: $O = bL^kC^jN^{1-k-j}$, where O is output, L labour input, C capital input, N natural-resources input; and where on any given level of technological-organisational knowledge b, k and j are constants. The argument which follows is not limited to conditions to which this specific production function is applicable. Extension of the argument to other types of production function requires merely awareness of the fact that it is generally possible to describe magnitudes, changes in which (or changes in which with specific constraints) alter the total output, for given values of L, C and N,

[1] I am indebted to Professor James Tobin for reading the manuscript of this article and for discussing it at length with me.

[2] See, perhaps, mainly Chapter XIII in Volume One and Chapters XIII through XV in Volume Three of *Das Kapital*.

without altering the relative distribution of income. In our production function, b is this magnitude. A change in b, unaccompanied by a change in k or j, alters the total product but not the relative distribution of income. We shall also assume that it is always possible to describe magnitudes, changes in which (or changes in which with specific constraints) alter the relative distribution of income without changing the total product for given resource inputs. In our production function, a change in k or in j, or in both, coupled with the appropriate change in b, alters merely the relative distribution of income, although a change in k or in j, or in both, unaccompanied by a change in b, usually alters the total product as well as the relative distribution of income.[1]

Later we shall suggest that it is useful to regard innovating activity as the more plentiful the more it raises the total product for given resource inputs, and to regard innovating activity as the more relatively labour-saving (or capital-saving or land-saving) the more it reduces the relative income-share or labour (or of capital or of natural resources). Given the resource inputs, more plentiful innovations express themselves in higher average productivities for all resources; the relative factor-saving effects, on the other hand, may be viewed as effects on the gap between the average and the marginal productivity of each resource.

A function of the Cobb–Douglas type will be employed here merely for illustration. The prices of resources will be equal to the respective partial derivatives of the function $\left(\frac{\delta O}{\delta L}, \text{ etc.}\right)$ multiplied by a term which in the limiting case of perfect competition is equal to one but is normally determined by the degree of monopoly power. This is the term by which the marginal physical products must be multiplied to give the marginal value products (or marginal revenue products). The argument will disregard the fact that as a consequence of indivisibilities we might obtain increasing returns to some factors *even on a given level of technological knowledge*. In other words, we shall assume that if over long periods historically non-diminishing returns are observed for a factor, this is (in the main) a consequence either of techno-

[1] To put it quite generally, if w stands for the real wage-rate, and for the rest the symbols of the text, *supra*, are used,

$$\frac{O}{L} \cdot \frac{Lw}{O} = w$$

Analogous identities hold for the other factors. In the Cobb–Douglas function, a change in b alters $\frac{O}{L}$ for a given $\frac{Lw}{O}$; a change in the L term's exponent (k) alters $\frac{Lw}{O}$ and usually also $\frac{O}{L}$. But it is possible to describe a change in k and an accompanying change in b which leave $\frac{O}{L}$ unchanged, while altering $\frac{Lw}{O}$. This follows from

$$\frac{O}{L} = b\left(\frac{C}{N}\right)^{j}\left(\frac{N}{L}\right)^{1-}$$

and from $\frac{Lw}{O} = k$ (or $\frac{Lw}{O}$ equals an expression which depends exclusively on k for any given degree of monopoly). Even if we extend these propositions to conditions to which Cobb–Douglas functions do not apply, it is reasonable to assume that $\frac{O}{L}$ can change for a given $\frac{Lw}{O}$, and vice versa.

logical-organisational progress, or of the fact that the input of the other factors has been rising in a no smaller proportion than that of the factor in question.

(2) Let us assume that if the economy moves continuously at the rising capacity level of output, the saved proportion of income is such that $\frac{C}{L}$, as well, of course, as $\frac{C}{N}$, is rising. So far, this has actually been the case in industrial economies. The proposition that, without thorough-going institutional change or without a very slow and painful adjustment process, savings *could not* diminish more than to a limited extent at the capacity level of output (even if the maintenance of capacity production should require such a decline) implies a denial of the validity or of the significance of Say's Law. It implies either a denial of the theoretical validity of this law or the assumption that the slowness and the hardships of the process by which Say's Law might at the end come through are "prohibitive" for practical purposes. The Marxian system, in contrast to the classical, contains such an assumption. Widely used present-day systems of an otherwise very different character also do.

(3) With the supply of natural resources (N) fixed, and their productivity depending on technological-organisational knowledge, innovations must necessarily increase $\frac{O}{N}$. The more plentiful the innovations are, the more they will raise $\frac{O}{N}$ and, for any given L and C, the more they will also raise $\frac{O}{L}$ and $\frac{O}{C}$.

Given the effect of innovations on k and j in our production function (and thus given the relative income distribution) and given the trend in the degree of monopoly power, sufficiently plentiful innovating activity can always raise the total product to such an extent that neither the rate of return on investment nor the real wage-rate declines (indeed that both rise and that even the rent from natural resources rises). In the first place, if the innovations lower, for example, k, the lowering of this exponent (which is necessarily associated with the rise of at least one other exponent) *may* raise the total product, and it *may* even raise the total product so much that the marginal product of labour rises (though its relative share must, of course, decline).[1] But even if a lowering of k should reduce the marginal productivity of labour, and a lowering of j should reduce the marginal productivity of capital, the same innovations which lower these exponents can raise b sufficiently to raise on balance the marginal productivity of labour as well as that of capital. If we decide to call innovations the more *plentiful*, the more they raise the total

[1] $\frac{\delta O}{\delta L} = kb\left(\frac{C}{N}\right)^{j}\left(\frac{N}{L}\right)^{1-k}$. The effect of a lowering of k on $k\left(\frac{N}{L}\right)^{1-k}$ and on j depends on assumptions which are not decided by the statement that we are concerned here with innovations such as reduce the value of k.

output for given inputs of all resources, and to call them the more *relatively labour-saving* (or capital-saving or land-saving) the more they reduce the relative share of labour (or of capital or of land), then the following conclusion emerges. Innovating activity can be so plentiful—its overall strength can be so great—that all factor-price trends will satisfy any desirable objective for any given distribution of the labour-saving, capital-saving and land-saving effect of the innovations and for any given rise in the degree of monopoly power. Using the Cobb–Douglas function, we may illustrate this proposition by the statement that the increase in the b term can always be great enough to outweigh any unfavourable effect of other circumstances on any factor price. But the other unfavourable circumstances must then be "given." The proposition loses its general validity if certain unfavourable circumstances grow *pari passu* with the increase in the quantity of innovating activity. In the interpretation of Marxian hypotheses, it is essential to keep this qualification in mind.

Assume, for example, that the supply of capital and that of labour are rising rapidly, while the supply of natural resources stays fixed, and that the innovations are exceedingly labour-saving and capital-saving (relative to natural resources), so that k and j are progressively decreasing. Assume also that the degree of monopoly power is progressively rising, with the result that the discrepancy between the physical marginal productivity of labour and the wage-rate is also increasing.[1] Even in these circumstances, the trend in b may be such as to produce favourable trends both in wage-rates and in rates of return to investors. But this assumes that the trend in k does not become the more unfavourable for labour, and the degree of monopoly does not rise the more rapidly, the more favourable the trend in b becomes. It also assumes that the trend in j does not become the more unfavourable for investors the more favourable the trend in b becomes; and that a more favourable trend in b also does not "come in a package" with an increase in the rate of saving $\left(i.e.,\text{ with an acceleration of the rise of } \frac{C}{L} \text{ and of } \frac{C}{N}\right)$ which is so great as to result, on balance, in a reduced rate of return to investors.[2]

(4) The crucial hypothesis in the Marxian system can, it seems to me, be expressed by the statement that more plentiful innovating activity is associated:

> (1) with a greater relative labour-saving effect of the innovations and a more rapid increase in monopoly power, so that wage-rates fall;

[1] Whether we should say that monopoly power creates an analogous discrepancy also between the marginal physical productivity of capital and the rate of return to investors is not quite clear. This is because, for the present purpose, we should presumably include quasi-rents in the return to capital (we should value capital at the cost of production of capital goods), and if this is done it is not clear at all whether in the long run monopoly power increases or decreases the rate of return at the margin of investment. The rate of return may well be increased if we include in it the predictable future formation of quasi-rents (monopoly rents).

[2] $\frac{\delta O}{\delta C} = jb\left(\frac{L}{N}\right)^{k}\left(\frac{N}{C}\right)^{1-j}$. Therefore the more capital there is in the system, the lower the marginal productivity of capital for a given b.

(2) with an accelerated rate of increase in $\frac{C}{L}$ and $\frac{C}{N}$, so that rates of return to investors, too, become reduced.[1]

To illustrate again with a function of the Cobb–Douglas type, a favourable trend in b here becomes coupled with a downtrend in k. Even if b did not rise, a downtrend in k would not *necessarily* bring a downtrend in wage-rates, especially not if $\frac{C}{L}$ is rising at the same time (see p. 18, *supra*); but if the process is accompanied also by a sufficient increase in monopoly power, then wage-rates will *have* to fall. It is always possible to describe an increase in the degree of monopoly (*i.e.*, in the discrepancy between marginal physical product and marginal value product) that is sufficient to reduce real wage-rates when k is subject to a given downtrend and b to a given uptrend (even if the uptrend in b is very steep). Furthermore, it is always possible to describe an increase in the ratios $\frac{C}{L}$ and $\frac{C}{N}$ which is sufficiently great to bring about a fall in profit rates for any given uptrend in b.

If these trends become coupled "in the appropriate way," it is not possible to argue that more innovations would improve either the wage trend or the trend in the profit-rate. The technological escape from diminishing returns is blocked. Workers do not benefit from accelerated technological progress because a higher labour-saving effect and an increase in monopoly power "come in a package" with increased technological progress; and investors do not at the end benefit from rapid technological progress because an excessive rate of capital formation is induced by it. Both wage trends and profit trends become exceedingly unfavourable, even though the rate of innovating activity may be very high. We have here a mechanism of automatic maladjustment, so to speak. Moreover, it is not even necessary to represent this mechanism as depending on the existence of a third factor which may gain at the expense of labour and capital, or on an increase in monopoly power.

The workings of such a mechanism *may* involve an increase in rents from natural resources at the expense of the other distributive shares. But this is not how such a mechanism need necessarily operate. The mechanism could, in principle, operate even in a two-factor world such as is exemplified by the production function $O = bL^kC^{1-k}$. Assume, for example, that in a two-factor system, where natural resources are disregarded, L is kept constant and C is rising along given production functions. The following two conclusions emerge immediately: (1) for a given degree of monopoly, wage-rates will rise and the rate of return on capital will decline; (2) the total output-increment will be insufficient to permit a redistribution at the expense of wages such as would keep the rate of return on capital (including subsidy)

[1] Analogous conclusions could (in principle) emerge from assumptions of this sort *even in a two-factor model*, with $O = bL^kC^{1-k}$. Even in such a model it is theoretically possible to describe a "package" consisting of a rise in b, a lowering of k, a rise in monopoly power and a rise in $\frac{C}{L}$, which on balance reduces both wage-rates and profit-rates. We shall return to this problem in the text.

from falling when the wage rate (net of tax) is kept constant. The second of these two conclusions is a direct inference from the assumption that the marginal productivity of capital is declining. There is not enough additional output to keep *both* factor prices from falling. From these statements it follows that the proper " redistribution " may result in a fall of both the wage-rate and the rate of return on capital. We have been arguing the case on the assumption of given production functions, but the analytical result gives us a safety margin in the sense that the result will stand at least some amount of increase in output as a consequence of innovations. The increase in output through innovations which the analytical result will stand is the greater the more the ratio $\frac{C}{L}$ rises. This is because the marginal productivity of capital declines the more, the greater the rise is in $\frac{C}{L}$, and the output-deficiency (as compared to the requirement for keeping both factor prices from falling) is the greater, the more the marginal productivity of capital declines.

The characteristics of the two-factor problem are simple if we include in our system a process of " redistribution " (at the expense of wages) such as does not in itself raise the total output for given resource inputs. Rising monopoly power may be assigned the role of an output-neutral (more precisely, of a non-output-raising) redistributive process.[1] Raising monopoly power may be redistributive in the required direction because it reduces the marginal value product of labour and thus the wage-rate, and it may increase the rate of return on the cost of production of capital goods.[1] The process of lowering k in the two-factor Cobb–Douglas function $O = bL^kC^{1-k}$ is redistributive, too, in the required direction, but in the event of $C > L$ it is also an output-raising process. However, even with $C > L$ the process of lowering k can be made output-neutral by a compensating reduction of b; considering that capital formation does not give us enough output-increment for keeping *both* factor prices from falling, the double-downtrend in factor prices can thus be obtained even at an unchanging degree of monopoly, with a safety margin for an output-increasing effect of innovations.[2] Obviously, the analytical operation of obtaining the double-downtrend for continued capital formation is generally simpler in a three-factor than in a two-factor system, because in the three-factor system the required redistribution at the expense of wages may become coupled with any degree of further increase in output as long as the process causes the relative share of the owners of natural resources to rise sufficiently.

Even on the level of *a priori* analysis it is necessary, however, to make a qualifying observation at this point. For physical reasons the per-period rate of increase in the ratios $\frac{C}{L}$ and $\frac{C}{N}$ cannot be pressed beyond some point.

[1] See footnote 1, p. 19.

[2] In such a model, innovations start having an output-increasing effect not where b is increased but already at the point where b is decreased by less than what would be required to neutralise the output-raising effect of the change in k.

Current capital formation must obviously fall short of current output by an appreciable margin. Therefore, there is a limit to the quantity of innovating activity (to the output-raising effect of innovations) which is compatible with the assumption that an induced increase in $\frac{C}{L}$ and $\frac{C}{N}$ *of practically possible size* will lead to a downtrend in profit-rates in spite of the innovating activity.[1] Yet the favourable effect on profit-rates of a substantial quantity of innovating activity *could* (in principle) be outweighed by the consequences of an induced rise in the ratio of capital to the other resources.

(5) The foregoing interpretation of the Marxian system disregards lines of reasoning which emphasise structural maladjustments as the main causes of declining profit-rates. Marx expressed great pessimism with respect to the ability of the capitalist system to adjust its structure of production to the demand structure, and he believed that the immobility of resources would make it increasingly difficult to realise profits. Even the adverse effect of technological progress on the wage level is explained in the Marxian analysis with a good deal of emphasis on structural maladjustments and on the immobility of labour, so that our purely "long-run" interpretation may perhaps give rise to objections in this regard too. The Marxian long-run difficulties may in part be long-run only in terms of clock time. In part, Marx may have had in mind difficulties the analytical nature of which is "short-run," but which, according to him, would repeat themselves all the time, and thus would tend to become perpetuated. Still, when trying to get at the core of this set of hypotheses, it seems preferable to move at the genuinely long-run level of analysis and not to place the whole burden of the theory (or even most of its burden) on frictions.

Our interpretation disregards also the possibility that the Marxian analysis implied a simple underconsumptionist proposition which confuses total effective demand with consumer demand and therefore feels under no obligation to explain why a less than unitary average propensity to consume should cause stoppages. Marx's use of the labour-value theory does sometimes suggest just this naïve-underconsumptionist reasoning, but I believe that the statement in the preceding pages brings out the essence of the crucial hypothesis more adequately. The main function of the labour-value theory in Marx's work is that of linking a set of hypotheses to a "creed" in which the judgment is prominent that all non-labour income results from "exploitation," and hence is objectionable. This note is concerned with the Marxian hypotheses rather than with the creed to which they are linked. In the interpretation of the hypotheses themselves it is desirable to by-pass the labour-value theory, which, after all, is a very confusing theory.

(6) However, it is necessary to add a word about unemployment, which has not so far been mentioned explicitly. One type of unemployment

[1] This may well be what Mrs. Robinson has in mind when arguing that implausible assumptions with respect to the steepness of the slope of capital's marginal productivity curve are required to arrive at the conclusion that a downtrend in wage-rates will be coupled with a downtrend in profit-rates. See Joan Robinson, *An Essay on Marxian Economics*, p. 37.

supplements the unfavourable trend in real *wage-rates*, because wages cannot decline below a floor level (and, from the present vantage point, we may also add that wages may show very little downward flexibility even at high levels). Thus, one type of unemployment may develop because, at the given wage-rates, employers find it profitable to use less than the available labour force along with all the available stock of capital or, alternatively expressed, because, at these wage-rates, employers would find it profitable to use the entire labour force only if the capital stock were greater than it actually is. This type of unemployment does not depend on the insufficiency of effective demand, but could persist even if profit-rates were high and investment were as high as it can be within the limit set by the propensity to save at the capacity level of production.[1] Another type of unemployment may supplement the unfavourable trend in *profit-rates* and in investment, if full-capacity savings exceed investment and thus small investment activity creates insufficient effective demand. It is perhaps possible to view this second kind of unemployment also as a consequence of wage rigidities, but, at any rate, this kind of unemployment deserves to be distinguished from the first type. The first type is a consequence of labour's being abundant in relation to the other factors or is a consequence of the high labour-saving effect of innovations, while the second type of unemployment is a consequence of capital's being abundant in relation to the other factors or is a consequence of a high capital-saving effect of innovations. If the crucial hypothesis of the Marxian system were accepted, there would be room for chronic unemployment of both kinds. In other words, even if capitalism did not produce the second type of unemployment, labour would still not be fully employed in the Marxian system. The first type of unemployment would still exist.

Those who are worried about excessive "automation" fear the first type of unemployment. They usually fear *only* this type, which, however, has had little significance in *advanced* economies. Keynes, in the *General Theory*, was concerned only with the second type of unemployment, which he expected to become chronic in advanced economies but which in reality has so far stayed limited to cyclical contractions.

(7) Over the century or so that has elapsed since Marx formulated his ideas, the central hypothesis of the Marxian system has proved unrealistic. Given the propensity to save of successive decades and given the rate of increase in the labour supply, the innovations have been sufficiently plentiful to raise the total output of advanced economies in a proportion no smaller than that in which the supply of the most rapidly growing factor (capital) has been increasing in them. This is another way of saying that in the countries for which we have data the capital-output ratio has shown no upward secular trend. At least in the United States, the capital-output ratio seems to have *declined* over a period including several decades, that is, the average productivity of capital seems to have risen. On balance, this

[1] Capacity production here means the output which can be produced with the available stock of capital. Where the first type of unemployment exists, this output is less than the output which would create full employment of labour.

cannot be the consequence of shifts in the composition of output from more to less capital-intensive activities, because on balance the Western world has been getting more capital-intensive, not less so. Failure of the average productivity of capital to decline, and especially a tendency for the average productivity of capital to rise (*i.e.*, for the capital-output ratio to fall), points to the "quantitative sufficiency" of innovating activity. In the recent literature it is sometimes implied that low capital-output ratios reduce investment, but as a general proposition this is wrong.[1] On the contrary, if a rise in the ratio of capital to the other resources has *not* become associated with rising capital-output ratios (with falling average productivities of capital) then this shows that innovations have been sufficiently plentiful to give us *enough* output per unit of all resource inputs. By this I mean that it is possible to describe a distribution of the land–labour–capital-saving effects which *would have* raised all factor prices.

As for the actual distribution of the factor-saving effects, the innovations have perhaps been *somewhat insufficiently labour-saving* to prevent a mild and not very consistent downtrend in rates of return on capital (before taxes); they certainly have not been so labour-saving as to prevent a significant uptrend in real wage-rates. Which of the various magnitudes have adjusted to others and what the precise characteristics of the adjustment process have been is, of course, an exceedingly complex question. But it seems likely that the relative factor-saving effects of innovations constitute at least in part *responses* to existing relative factor scarcities. At any rate, the character of innovating activity has not been badly out of harmony with the requirements set by relative scarcities in resources. It is also likely that business savings show some tendency to adjust to investment opportunities.

Experience has shown that innovations can very well become sufficiently

[1] The proposition, while generally misleading, is correct in those cases where the average productivity of capital rises as a consequence of shifts in the composition of output from more to less capital-intensive activities. Such shifts raise the gap between average and marginal productivity of capital to such an extent that the *marginal* productivity becomes lowered for additional capital formation. But, as was argued in the text, the observable trends cannot on balance have resulted from shifts of this sort. Where a rise in the average productivity of capital is a consequence of innovations, these innovations would have to possess a very high relative capital-saving effect (a very high gap-increasing effect as between the average and the marginal productivity of capital) to lower the marginal productivity and thus *ceteris paribus* to impede investment. The "normal" assumption here is that innovations raise both the average and the marginal productivity of capital, and thus *ceteris paribus* promote investment, although it is quite conceivable that the typical innovations have increased the average productivity of capital in a higher proportion than its marginal productivity. In the United States, the joint effect of *capital formation and of innovations* seems to have been gap-raising as between the average and the marginal productivity of capital (indeed, an increase in the average productivity of capital may have been associated with a mild secular decline in the marginal productivity). Capital formation, with no innovations, would have lowered both the average and the marginal productivity of capital, but we do not know whether such capital formation would have increased the gap between the two. *If so*, there is no reason to assume that innovations have increased the gap; *if not* (as would be the answer in the Cobb–Douglas model) there *is* reason to assume that innovations have had a gap-widening effect. In no event is there reason to assume that innovations viewed separately (apart from capital formation) tend to lower the marginal productivity of capital while raising its average productivity. To have had this effect, innovations would have had to increase the gap between the average and the marginal productivity of capital very greatly indeed.

plentiful without becoming excessively "labour-saving" (either directly by their technological character or indirectly by their effect on monopoly power) *and* without inducing an excessive rate of new capital formation. To have denied this was, it seems to me, Marx's crucial misjudgment.

Practically all major writers on business cycles share the view that temporary deficiencies of the innovational process, or structural maladjustments, or both, are among the causes of periodic contractions, but the characteristics of depressions have not come to dominate the long-run sweep of events in industrial economies. It is to be hoped also that in the future monetary–fiscal policy will prove more successful in its efforts to reduce the amplitude of cyclical fluctuations without causing chronic inflation.[1]

(8) Finally, on a somewhat different level of discourse, the question may be asked whether the difference between the actual record of Western economies and the record predicted by Marx is not the result of the equalitarian tendencies of the post-Marxian decades. If so, it could be argued that the labour movement, and thus perhaps indirectly Marx himself, deserve credit, at least in part and in some countries, for whatever favourable trends have become established.

It is unlikely that the labour movement should have led to a lesser degree of monopoly power than would otherwise have been observable (that is to say, to a smaller discrepancy between marginal physical product and marginal value product). Neither economic theory nor common observation create a presumption to this effect. The labour movement may have decreased the effective monopsony power of producers, but it is very unlikely that long-run monopsony power in the labour market should have become a significant factor in any circumstances. This is why we omitted the monopsony problem from the formulation which we used in the main sections of this note. It is true that the equalitarian tendencies of relatively recent decades may well have diminished the saved proportion of output and thus also the innovational requirements for maintaining the economy at the capacity level, but it is not safe to assume that these tendencies made it easier for our economies to stay at or near full capacity. These social trends have tended to reduce not merely the amount of investment needed for keeping the economy at the capacity level but also the willingness to engage in investment: they have reduced the propensity to save primarily by way of tax policies which are very likely to produce a disincentive effect on investors. While the equalitarian policies of recent decades presumably have diminished the degree of cyclical instability around the long-run path of the economy,[2] economic analysis provides no basis for a similarly favourable or secure evaluation of the effect of these policies on the long-run path itself.

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[1] Here we have "discretionary" policies in mind. For "automatic" stabilising effects, see Section 8, and footnote 2, below.

[2] This is the problem of the "automatic stabilisers" which should be distinguished from the problem of discretionary monetary-fiscal policies. See end of Section 7.

THE SCOPE OF AUTOMATION

WITH the accelerated growth of automation in recent years a new set of prophets has appeared predicting the future, but, in fact, obscuring the economic significance of automation. Ready-made suppositions are being propounded, such as:

(1) The scope of automation is limited to a small range of industries, firms and products.

(2) Automation will not bring any fundamental change in industrial organisation, as it represents only a continuation of mechanisation, rationalisation and scientific management as practised during the last fifty years. Automation will advance at the ordinary rate of technical progress.

(3) Automation will lead to a higher degree of centralisation and strengthen monopolistic tendencies.

An attempt is made in this article to examine the extent to which automation will affect industry. Some of the confusion which has arisen over the issue of automation can perhaps be explained by the vagueness of the term used and by the wide range of its interpretation. Automation may be interpreted as covering the first automatic devices of the eighteenth century as well as the latest near-automatic factory. Sometimes it is used referring to the " automatic handling of parts between progressive production processes," sometimes to the automatic control systems based on " feedback " [1] and similar mechanisms. At other times it may mean the electronic computing and data-processing machines.

Each one of these categories can be claimed to have evolved over decades or centuries.[2] But what distinguishes to-day's automation from past developments is the combination of the various modern techniques which yields a " break-through " in production methods. Owing to special circumstances—the defence efforts of the last fifteen years—technological developments which might have taken generations to mature were concentrated in a short space of time.

As a result, industry of to-day has at its disposal mechanisms which can count, remember, measure, compare, inspect, test, correct, start, stop, slow down and accelerate production. The newest devices are claimed to control not only output down to the smallest detail but also to check the health of the machine, to replace worn-out parts and to choose between

[1] " Feedback " implies that production at an early stage of output is fed with information about output at a later stage, and, if necessary, corrects itself according to the information received.

[2] Babbage's calculating machine was developed round 1835 and the Hollerith machine was already employed in the U.S.A. census of 1890.

alternative courses of action. They seem able to measure the dimensions of time, space, heat and sound.

It has been said that the effect of automatic tools should not be exaggerated because they are applicable in certain sections of manufacturing industry only, and long runs and large-scale production are essential for the necessary economies to be obtained. As manufacturing accounts for only one-third to one-fourth of total economic activity, and as large-scale production and long runs represent only part of all manufacturing, it would follow that the scope of automation should remain rather limited for some time to come.

Which Size of Firm

With regard to size two questions arise, which are closely interrelated: How far does automation influence the size and the growth of firms? How far is the use of automatic devices limited to or favoured by any particular size of firm?

The literature dealing with the relation between automation and size of firm avoids defining what is meant by "firm" or how "large," "medium" and "small" size is to be measured.[1] Moreover, the influence of automation on factors determining size, such as capital, turnover and employment (as well as the influence of these factors on automation), depends on market conditions.

Automation may reduce a firm's labour force and leave sales unchanged; or it may lead to a higher turnover in spite of an unchanged or even smaller labour force; or a still higher turnover may be produced by an increased labour force. Automation may thus reduce size as measured by number of employees yet increase size as measured by capital used or by turnover. In this case a firm will benefit from the various advantages arising from the economies of larger turnover (buying and selling), as well as from the benefits of a smaller labour force (managerial capacity; lines of communication; workers' "sense of belonging," etc.).

Wherever automation makes it possible for a firm to grow in terms of capital or of turnover without an increase in the number of employees the benefits of larger turnover can be reaped without the employment of additional man-power and, where factory space is limited and fully used, without recourse to the building of new premises. In this way, automation can by-pass one barrier limiting the growth of firms, bringing benefits of larger size (measured by capital or turnover) to firms which would otherwise have been excluded from them. Instead of being eliminated by automation, this type of firm may actually benefit.

[1] The statistical snags in comparing the size of different firms either by capital employed, by value of output, or by manpower employed need not be elaborated here. Conditions of monopoly or competition and elasticities of demand would largely determine how far automation would lead to a reduction in price for a given product so that value of output would not be a function of size alone.

On the whole, automation is likely to reduce size-determined differences in efficiency of work, quality of output, overheads, and therefore in manufacturing costs per unit. It seems that devices for automatic inspection and quality control can be designed for any quantity of output. Furthermore, labour efficiency in an automated factory is determined not so much by the superior technique of supervision to be found in large-scale enterprise as by the smooth feeding and working of the automated machine.

The advantages arising out of larger size lie rather in the field of business finance and of sales pressure and in the superior opportunities for training and attracting new skills. Still, it seems that the new industries developing in connection with automation, such as the electronics and the plastics industries, demand and react to the flexibility and enterprise of the innovator of moderate financial strength.

At the same time, " large-scale enterprise " is no longer identical with the centralisation of a large labour force in a few giant production units; it can also mean the duplication and multiplication of a production process spread over a number of smaller production units.[1] In fact, observations made in recent years support the view that automation does not require " large size." [2]

D. S. Harder, Vice-President of the United States Ford Motor Co., an expert in automation and co-creator of the term " automation," has stated [3] that automation might be used in all types and sizes of industrial concerns. " The idea that only the very large, mass-producing industry could successfully use it, has been disproved again and again. . . . Automation is more than transferring material from machine to machine, it is a new concept of manufacture. . . . Instead of smaller plants going out of business, they will use more automation." Diebold, another American expert, co-author of the term " automation " and author of the standard book on the subject, stated [4] that the appearance of flexible automatic equipment on the market would make it possible for smaller concerns to operate on an automatic basis and in many fields to compete with larger firms. New materials, such as plastics and light metals, will favour this process. Application of the new processes in small establishments ranges from fully automatic lines to partial automation of a single machine.[5]

Many examples can be given to support these claims. The manufacture of automatic control equipment, a new and expanding industry, is well suited for the small and medium-sized firm. In the United States, for instance, some thousand firms share in a market valued at present

[1] See also p. 30.

[2] In the absence of any definition one might assume that the term has been used for firms which, in their respective industries, were considered large whether measured in terms of capital, output or manpower.

[3] Automation Conference, Davenport, Iowa, August 1954.

[4] Diebold, *Automation*, p. 137.

[5] *American Machinist*, February 28, 1955.

at some $3,000–3,500 million a year. Most of the 55,000 varieties of components produced in the electronics industry are supplied by small companies, each one specialising in some field and achieving production at a cost sufficiently low not only to compete with larger companies but also to prevent larger companies from competing.

To give another example of the role the small firm can play in industry as a result of automation: General Mills Inc. brought out the well-known "Autofab," a large-size machine for the automatic assembly of electronic components. ("Autofab" requires also two or three auxiliary machines for preparatory work.) The company expects to sell $30 million worth to large firms, $30 million worth to medium-sized firms, and $40–45 million worth to small-sized firms. The company are now developing cheap models costing $3,000–$15,000 apiece, depending on the proportions of manual and automatic operations, specially suited for the small manufacturer.

On the other hand, certain sections of industry will leave little or no scope for small-scale enterprise. For instance, industries based on the "flow-concept" of automation are best suited for the large firm. These industries working with liquids, pulped solids, gases and energy, such as the oil industry, the electricity industry, modern breweries, paper, textile and flour mills, and certain sections of the chemical industry, require plant which is far beyond the means of the small firm.

Automation will not lead to the extinction of the small firm, but it will accentuate the division of industry into two sections, one where the very nature of the manufacturing processes leaves the field to the large-scale enterprise—the "Sector of the Guards"—and the other where there is still room for the small and medium firm. Wherever automatic equipment is so expensive that it is beyond the financial strength of the small and medium firm to replace their old equipment and plant by new automated machines and plant, the small firm will die out. But as a species it will survive and spread, at least for some time, in the remaining automated and non-automated sectors of industry.

Effect on Location of Industry

When using such terms as "large-scale" and "small-scale" one has to keep in mind that in the age of automation measuring size by the volume of employment or by factory space, may become a statistical procedure even less reliable than now (see also p. 27). Employment and volume of output will frequently move in opposite directions. The reduction in labour force and factory space needed for a given volume of output will exert a considerable influence on the location of industry. Production can take place on a smaller floor area, as less space is wanted for the movement and general comfort of workers. An American firm, for instance [1]

[1] Eberhard Manuf. Division of Eastern Malleable Iron Co.

needed for two new automatic moulding lines an area of 100 × 72 ft., compared with an area of 450 × 72 ft. for conventional foundry practice.[1]

The smaller labour requirements of automated factories coincide with a tendency of large-scale enterprise towards decentralisation. In recent years many of the industrial giants of the United States, General Electric, General Motors, Du Pont, U.S. Rubber, Alcoa, Philco, U.S. Steel, etc., have aimed at the construction of relatively small plants.[2] While one of G.E.C.'s old plants employs some 20,000, employment in their new plants ranges from 50 to 1,500. Managerial efficiency, production costs, flexibility and industrial morale all seem to point towards this range for obtaining the optimum size.

One of the larger automated firms in the United States, the Sylvania Electric Products Inc., aims at a size of 600–700 employees per plant; correspondingly, they have spread their 26,000 employees over forty-three plants. With a relatively small labour force per plant they are able to decentralise production and to move to smaller towns, since they are no longer dependent on the vicinity of large urban conurbations for their labour supply. The firm adjusts working hours to local needs, so that, for instance, in farming areas workers starting work at 7 a.m. have, if they so desire, still time left for farm work. In this way, automation and, connected with it, decentralisation can contribute to geographical re-distribution of industry away from the congested areas, and to a better diversification of occupations in less-industrialised areas. (This factor may be of special significance in the development of under-developed areas.)

Automation will, however, also cause movements in the reverse direction. Industries and firms which have until now preferred to operate in regions with relatively low labour costs will find less incentive to stay in or to move into these regions when automation leads to a lower labour content in the value of the final product, and when the labour force has to include a growing proportion of well-paid, highly skilled workers. Other locational factors, such as proximity to sources of supply, to markets, to social and educational facilities, will gain in weight.

The change-over to automation may induce many a firm to close down old, non-automated plant if a new plant is expected to be, in the long run, more efficient and profitable than the modernisation of the old plant. If there has been no reason for carrying on production at the location of the old plant except continuation of the past, other factors will determine future location. Automation—with the change in the labour content of output, with the smaller requirements for labour and floor space, together with the trend towards decentralisation of manufacture by large firms—will thus greatly change the relative weight of the locational factors and influence the future location of industry.

[1] *Steel*, March 28, 1955. [2] J. M. Blair, "Technology and Size," *Amer. Econ. Review*, May 1948.

Long Runs and Short Runs

According to the mythology of automation, not only large-scale enterprise and centralised production but also "long runs" are required for automation to spread. This belief is not supported by available evidence. With automation the individual, independently operated, multiple-purpose machine has become possible; replacing a series of machines it can produce a wide range of products by a mere change and adjustment of the fixtures. A British automation expert [1] came to the same conclusion: in due course automation would be used for making complicated pieces in small lots.

New developments of revolutionary significance have been made possible by the tape control of machine tools, a device specially suited for the production of short runs. After one batch of an article or of a component part has been produced, the tape containing the instructions which controls the operations of the machine tool is withdrawn, stored and used again when new orders, replacements or spare parts, etc., require this. The momentum which this invention will give to the spread of automation can be gauged when it is realised that the bulk of American production, for instance, has been stated to take place in runs of less than twenty-five items of the same kind at one time.[2] The working of the tape requires a "methods engineer," a "programmer" for developing the instructions, a clerk for punching the instruction card and an unskilled operator—who replaces highly skilled machine-tool personnel—inserting the tape.[3]

Tape control of machine tools is still in its infancy, but it should, in the not too distant future, greatly enlarge the scope of automation. Of course, the economies of long runs will apply to the automatic machine not less than to more traditional machine tools. The costs of production per unit of output are likely to decline if one type of product can be kept on the production line; fewer adjustments will be needed, less time will be wasted in changing the production line, fewer losses will occur from changing the stocks of raw materials and components needed for obtaining a different product.

Although these advantages of a long continuous run for a product of specific design remain or increase under conditions of automation, considerable economies can still be achieved if orders are executed not in one long continuous run but in instalments so that the long run consists of a series of short runs. With automation this broken long run for orders to be executed in relatively small lots to be repeated as occasion demands is likely to grow in importance.

The introduction of automation, together with firms' desire to reduce costs per unit to a minimum, will speed up the much-needed progress in

[1] F. G. Wollard, "Automation," L.P.E. Papers Nr. 1, p. 10.
[2] Diebold, Hearings before U.S.A. Sub-Committee on Econ. Stabilization, p. 45.
[3] *American Machinist*, August 1, 1955.

the standardisation and simplification of products which has been advocated so often—already in the Balfour Report—for the purpose of cost reduction. The case of a firm manufacturing domestic cookers will illustrate this point. The firm sold sixteen varieties at three different price levels; most of the types were produced at a weekly rate of 800–900, with a maximum number of 2,000–3,000. The runs were, on the whole, considered too short to justify automation. A redesign of the cooker aimed at producing a basic standard unit around which the various additional components and gadgets could be grouped in various combinations. In this way long runs of 8,000–9,000 units per week were made possible, an output which justified the introduction of automatic processes and at the same time reduced costs and prices.

The Productivity Team which, on behalf of the Anglo-American Productivity Council, reported on "Simplification in Industry" mentioned many cases where, independent of automation, efficiency had been greatly increased by simplification and standardisation. The Team expressed their conviction "that an organised and determined effort to reduce our manufacturing variety still further could make a rapid and major contribution to increasing productivity and lowering costs in British industry." The Committee for Standardisation of Engineering Products, appointed by the Ministry of Supply in 1948 and working under the Chairmanship of Sir Ernest Lemon, came to similar conclusions.

Since simplification and standardisation are essential for obtaining long runs of production and as automation profits from long runs, the two developments are complementary. Thus, automation will not only enter the field of short-run production but will also stimulate and, at the same time, be stimulated by the drive for greater efficiency by means of standardisation and long runs.

Industries Affected by Automation

It may be argued that even if all manufacturing, and not only large-scale and long-run production, could be automated, this would still affect only slightly more than one-third of national output. The present-day fashion of reducing major problems to minor ones by measuring them against some global entity—income, output, exports, etc.—seems specially out of place here. In view of present-day rigidities of the factors of production, one should examine, sector by sector, what influence automation is likely to have on industry. The fact that all of a sector's output may, sooner or later, be affected by automation is important even if this sector represents only 10% or less of total economic activity. Moreover, the idea of automation affecting only manufacturing industry does not accord with what evidence we possess.

When trying to forecast what industries are the most likely to introduce or expand automation within the next two decades, one has to bear in mind

that different industries will introduce automation at different times and in different degrees according to technological developments and to economic conditions. Some industries are particularly suited, such as the "continuous-flow" industries mentioned above. Others are, at least for the time being, outside the scope of automation, such as the professions, personal services, agriculture, small-scale retailing, advertising, specified construction projects. Then there are those industries where full automation would technically be possible, but where, at present, only partial automation proves profitable, for instance, in furniture, packaging, large-scale retailing, transport, telephone. (In the United States the automation of telephone services is making rapid progress. Bell's Telephone used 9% dial-telephones in 1924, 55% in 1939 and 84% in 1954.)

Automatic assembly by means of the "printed circuit" which has come into use during the last few years,[1] has brought many assembly industries, such as wireless, television and electronic equipment, within the scope of automation.[2] This development, together with the replacement of the traditional vacuum tube by the transistor, which is more durable, much smaller, and more economical in power consumption, should greatly reduce costs and prices of these industries' output and should result in a considerable expansion of their markets. In the case of the electronics industry, the use of these two inventions—printed circuit and transistor—will accelerate the pace of automation, while with television and wireless new wants will be created and satisfied. (In the United States living-room radios now represent no more than a quarter of all wireless sets in use. Portable and clock radios and sets in other rooms account for the rest.)

Although manufacturing industry will take the brunt of the coming wave of automation, other fields of economic activity will probably soon be affected, such as building, shipbuilding and transport. In shipbuilding a trend towards pre-fabrication can be observed, towards the transfer of more operations from the slipway to the workshop, where automatic devices, especially with regard to welding, can be employed. The building industry is just now emerging from the experimental stage of pre-fabrication. In the United States some 125,000 pre-fabricated houses were built in 1955. One of the largest pre-fab building firms, Price Brothers, work with conveyor belts, automatic "jig-tables," hammers and saws; window openings are "sliced out" in 35 seconds, continuous spray guns apply paints. "Pre-fabrication may be said to have arrived in Wall Street."[3] Other countries as well, especially France, Germany, the Soviet Union, Italy, Norway and Sweden, have stepped up the building of pre-fab houses. The methods of

[1] Britain's first fully automatic assembly of wireless sets was organised in 1948, by H. A. Sargrove.

[2] An important new stage in automation has now been reached: automatic assembly is spreading to the metal-working industry and is to be applied to the assembly of products ranging from small electric motors to cylinder heads and engine blocks. (*American Machinist*, Sept. 10, 1956.)

[3] "Barron's," March 14, 1955. Refers to the introduction of pre-fab stocks.

pre-fabrication have by now become so adjustable that buildings can be produced in a wide variety, without the austerity features of the earlier types. As a result of automation, the era of protection for traditional building may be drawing to a close. (In the field of building materials, an American firm has recently introduced an electronically controlled mixer which can produce 1,500 different mixtures.)

As to transport, recent information given by one of the large industrial combines suggests great possibilities for automatic warehousing. After the introduction of " palletisation " warehouse labour costs are said to have been reduced by 60%, and man-hours required for the movement of one ton of goods to have been cut from 1·22 to 0·44.[1] The cost of constructing these pillarless warehouses has been reduced by some 40%.

In rail transport, the first experiments with automatic yards have proved successful. In the United States the Pennsylvania Railroad expect, from their new $34 million Conway yard near Pittsburgh, with automatic handling and dispatching of freight cars, an annual saving in operating expenses of $11 million.[2] At present, a daily volume of 1,500–2,000 wagons is considered sufficient for automation to be economical. (An increase in labour costs would shift this range downwards.) Expenditure for freight cars is greatly reduced, as fewer wagons are needed owing to the greater speed with which they are handled, an interesting example of a reduction of secondary investment by automation. How far automatic trains will prove an economic proposition—they are technically possible already—is difficult to judge at present.

The Electronic Computer

If one is inclined to speak of a second industrial revolution, it will apply at least as much—if not more—to the office as to the factory. To argue that Babbage's calculating machine has been invented more than 100 years ago, and that the process of mechanisation of office work with electric typewriters, dictaphones, punch-card systems, etc., has been going on for a long time, is to overlook that with the electronic computer something different in kind has arrived, which will greatly influence industrial, commercial and governmental administration, as well as social and industrial research.

True, automation in the office is still in the experimental stage, with relatively few machines performing everyday tasks. However, progress in this field is rapid; an electronic computing machine brought out in 1953 has been claimed to have 25–35 times the speed of the first machine of this type introduced by the same company in 1948.[3] Since then further progress has been made. However, comparisons of these computers with

[1] Sir Geoffrey Heyworth at Annual General Meeting of Unilever Ltd., May 26, 1955.
[2] *Wall Street Journal*, June 29, 1955.
[3] *Monthly Labour Review*, June 1955, p. 640.

the human brain will lead only to miscalculations about both their possibilities and their limitations. They are infinitely inferior in some respects, greatly superior in others. The artistic, creative, sensitive, unpredictable working of an individual's brain and the mechanistic, automatic working of the computer are not really comparable phenomena. The revolutionary significance of the electronic computer lies in its speed, its precision, its reliable memory for a selected field of facts and its capacity for long, uninterrupted work. It can, faced with a series of alternatives and combinations of alternatives, make the right choice in a short time. (As much of human "originality" consists in a new combination of various known factors, there is no reason why, in selected fields, the electronic computer should not excel in this quality as well.)

The electronic computer's usefulness stretches over a wide field of production, distribution, administration and research. In certain production processes it is essential to compute the results of a process quickly enough to influence the next stage, but traditional methods of computing have been too slow. In one chemical process, for instance—the conversion from natural gas to acetylene—a computer is needed which produces results in less than 1·3 seconds. Here again, automation emerges as something more than a mere continuation of mechanisation.

The computers can also be used for engineering calculations—General Electric of the United States installed the first large electronic computer in 1952 for this purpose, and, by the end of 1956, eight of this type are expected to be in operation, in addition to 120 small and medium-sized computers. The larger part of computing time is to be used for engineering calculations. The extent of, and the skill in the use of, these computers should considerably influence the rate of invention and innovation and the competitive strength of firms.[1]

The suitability of the computers for extensive input–output analysis makes it possible to calculate the optimum combination of the factors of production in a multiple-product firm for any given sales volume. Any adjustment in stocks required for a change in the production programme can be easily calculated. Financial burdens and losses arising from overstocking can thus be greatly reduced; on the other hand, interruptions of production owing to shortages in some material or components can be avoided. Once this new type of stock-control has become general, investment in stocks and the needs for working capital should decline (another example for a reduction of secondary investment through automation).

Costs per unit of output, profits and losses can also be calculated in great detail, at frequent intervals, and with the results quickly available. Scientific management, until now mainly a slogan, well-meant and much misunderstood, has moved much closer to being established in industry;

[1] The I.C.I. have recently ordered five large electronic computers of different types (*British Chemical Engineering*, September 1956).

supported by the new computing capacity, management can plan production schedules, establish optimums, discover margins. The electronic computer may bring the economic theoretician and the industrialist closer together; it can, no doubt, substantially contribute to higher efficiency.

The Scope of Office Automation

There is little danger of the new computers displacing clerical labour when used for industrial purposes; most of this type of computing work has not, or not frequently, been done in the past. Still, the effect of automation on general office work should be of a high order. The electronic computers can replace the ordinary clerk in his task of calculation, accountancy, invoicing and costing, they can type, sort and file at extreme speed—the filing being carried out on tapes or in tubes. A large insurance company which used to occupy fifteen floors for housing its files now needs only one medium-sized room for storing a few hundred spools of magnetic tape containing the same quantity of information.[1] (Yet another example for automation reducing secondary investment.)

Automation, in the form of the electronic computor, will affect banks, insurance offices, Government Departments, Local Authorities, mail-order houses, public corporations and the offices of industrial and commercial firms. Here, a new feature of automation emerges. The large electronic computers are expensive, and they possess a great capacity for work. To make them pay their way, firms will be inclined to keep them as fully occupied as possible. This can be achieved only if the machines established at headquarters are fed with information provided by a number, or by all, of a firm's branches.

Thus the Bank of America's " Erma " computer, which is expected to handle some 50,000 bank accounts with the help of nine operators, serves a group of bank-branches in California. Sylvania Electric Products Inc., which believes in de-centralisation of manufacturing, is, at the same time, constructing a centralised data-processing system. Headquarters will, by means of a 12,000-mile private electronic communication system, be connected with all the company's plants, laboratories, offices, warehouses, etc., in fifty-one cities. At headquarters a Univac computer will be installed which will digest all the information fed over the system and work out production, marketing and research problems for all managerial levels. Thus, just when manufacturing has reversed its trend towards ever-larger production units and tends towards de-centralisation in smaller-sized units, the introduction of the electronic computer brings about more centralisation of administrative work.

Here, too, the field is not entirely left to the large firm. Smaller electronic computers are available costing only between one-twentieth and

[1] Diebold, *Automation*, *op. cit.*, p. 94.

one-third of the large computers.[1] The difference is to be found mainly in the speed of operation, the number of operations per second varying between 500 and 5,000. With recent developments of valves being replaced by transistors, small and even portable electronic computers can be envisaged. For the more ordinary type of sorting, adding and tabulating, electronic computers are, of course, no paying proposition, and traditional equipment will remain in use. There is also the possibility of hire and hire-purchase. In the United States as well as in this country, electronic-computer services can be rented at hourly rates, together with specialists who convert the firms' problems into equations to be fed into the computer. The cost of hiring a computer in Britain seems to be in the neighbourhood of £25–35 per hour, representing about two years' work of conventional calculating methods. Monthly rent in the United States varies from $2,000 to $20,000. So many types of computer are now being developed that soon a " custom-made " computer service will be available to any firm willing to make use of it.

Government Departments, too, are likely to use the electronic computer for digesting the vast quantities of information at their disposal. It will become possible to carry out censuses and sample inquiries more frequently and in greater detail. (The time may not be far off when even the Patent Office—once the records have been adjusted to the needs of the system—may be able to catch up with new inventions coming in ever faster.)

Public Authorities will be able to calculate the lowest tender, taking into account transport costs and differential rebates. Losses suffered by the Armed Forces as a result of surplus and badly balanced stocks, as recently reported in the United States and in this country, can be avoided by electronic stock control. Logistic problems can be quickly calculated. On the whole, what is true of the private sector of the economy may apply equally to the public sector: a greater quantity and a higher quality of the product—in this case, of information—will be provided, the field for human error and ignorance will correspondingly shrink, and efficiency will generally improve (if the machines are asked the right questions for the right purpose).

Statements to the effect that heavy cost will prevent a rapid development of automation need to be qualified. First, as already mentioned, the possibilities of hire and hire-purchase will help to bring automation to the financially weaker firm. Secondly, not all automatic equipment involves heavy initial expenditure. Third, where equipment is expensive, capital costs may not greatly exceed that of corresponding non-automatic machines, while running costs, by the very nature of automation, are bound to be cheaper.

What really matters is the relation between capital costs and operating costs of old and new equipment, and the rates of depreciation and obsoles-

[1] The Manchester University computer cost £90,000, the British Tabulating Machine Co's "Hea" cost £23,000.

cence. Frequently, full automation will not, but partial automation will be an economic proposition.

Estimates of the reduction in calculating costs achieved by the use of electronic computers vary from one-twentieth to one-thousandth of the cost with conventional methods. One has also to consider that automatic manufacturing equipment can reduce operating costs to such an extent and in so many ways that initial capital cost becomes less important: automatic inspection and feed-back systems ensure higher quality, less sub-standard output, fewer hold-ups and greater speed of machines, while less factory space and office space, less lighting and heating, per unit of output is required, and overhead costs are reduced correspondingly.

As to depreciation, the machine-preserving and protecting features of automation should tend to reduce costs. It has been estimated [1] that, owing to the increased efficiency of automatic equipment, expenditure on large automatic installations can be recovered in about three years (on average), while the period for smaller automatic equipment would sometimes be as short as a few months or even weeks.

The impact of all these advantages of automation will soon force non-automated firms in industries suitable for automation to follow their more enterprising competitors. Until now, technically backward firms could compete with newly equipped firms as long as they were content with smaller profit margins. They could work with machines which had already paid their way, and they had to shoulder mainly current costs, whereas the modernising firms had to carry the heavy capital burden of their new equipment. Now, however, the automatic plant produces not only more output per unit of capital but also better-quality output. It is no longer competition in cost only, which, to some extent is adjustable, but competition in quality, which cannot be met except by acquiring the new automatic production technique.

Of the two forces, resistance to change and, on the other hand, the drive for change and innovation, the latter is, in the case of automation, likely to prove stronger. (At a machine-tool show held at Chicago in the autumn of 1955 it could be claimed that the past eight years had brought more innovations than the eighty years before.[2])

Whilst technical progress in the first half of the century was limited to certain fields of manufacture, above all to engineering and vehicles, and directed largely towards the production of new consumer goods, such as the motor car, the wireless and other semi-durables, where a reduction in cost and price led to a great expansion of markets and employment, the automatic-electronic developments of the second half of the century will spread over a much wider field of manufacture, to construction, transport,

[1] F. Garner, Director of Joseph Lucas Ltd., *Report at Conference on The Automatic Factory*, issued by the Institution of Production Engineers, June 1955, p. 43.

[2] *American Machinist*, September 18, 1955.

commerce, distribution and administration, and as far as output is concerned will affect mostly producer goods.

Conclusion

Surveying what has been achieved through automation, one wonders how far it is still possible to envisage the limits of its potential. The rate of further development of automation will depend not only on technical possibilities but also on the attitudes of governments and of industrial and labour leaders. They will have to decide whether the process of automation should be slowed down in order to reduce the difficulties of adjustment, or should be speeded up in order to remain competitive.

The choice is more apparent than real. It will be imposed upon this or any one country by developments in other countries which are forcing the pace of automation, partly because it plays so great a role in the output of defence equipment, partly because of its superiority in peace-time production.

Automation will spread, and so will its influence on the future structure of industrial organisation: size and location of firms, the growth of new industries, employment and investment, rate of technical progress, the division of labour, the distribution of income, wage-differentials and working conditions, managerial functions, time-and-motion study, cost accounting, especially with regard to overheads. Traditional percentages added to labour costs will no longer provide a workable formula, while the relative importance of depreciation and obsolescence will, for a considerable stretch of time, be reversed. A new balance between centralisation and decentralisation of industry will emerge from the pull of forces moving in opposite directions, and at the same time the relative strength of competitive and monopolistic elements in industry will change.

Automation will also bear upon such matters as the balance of payments, the development of underdeveloped areas, technical education, defence expenditure and principles of taxation, especially of depreciation. There is opening up before the present generation of economists a wide and rewarding field for research. The sooner economic analysis based on factual information can replace highly speculative and often ill-informed opinion, the better.

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INDUSTRIAL DEVELOPMENT CORPORATIONS IN INDIA AND PAKISTAN

I. Introductory

The establishment of industrial development corporations in the post-war world has brought a new institutional pattern to the fore in the economies of under-developed countries. With the avowed objective of accelerating the rate of industrial growth and of overcoming the initial hesitancy of private enterprise, particularly in the launching of large-sized basic and key industries, these corporations have come to be regarded as an important step in bringing about a " balanced economy." The accent of such corporations is on " enterprise," whether private or public. As such, they are looked upon as a vital agency whose mission it is to reconcile the conflicting claims of the public sector and the private sector.

II. In Pakistan

It was to overcome the shyness of private enterprise that the Pakistan Industrial Development Corporation (PIDC) was established in Pakistan. The PIDC started functioning on January 12, 1952. It is doubtlessly a pioneering enterprise, unique in several respects. First, the Corporation was established by an Act of the Central Legislature of Pakistan. Secondly, all the directors of the Corporation were appointed by the Central Government. Thirdly, these directors were taken in as whole-time officers. In all these three respects the PIDC resembles the pattern of the British public corporations that grew up during the six years of socialist rule (1945–51) under the Labour Party.

Of course, there are important structural differences which create a gulf between the public boards of Great Britain and the PIDC. The latter, like joint-stock companies, was registered with an authorised capital of Rs. 1 crore (about £750,000 according to the post-devaluation value of the Pakistani rupee). In contrast to this, a public corporation has no share capital.[1] Moreover, a public corporation of the British pattern is a statutory monopoly dealing with only one industry, but having full control over it. The PIDC, on the contrary, commands monopoly rights in neither the ownership nor the management of any industry. It is expected to deal with a multitude of diverse industries which the Government of Pakistan consider vital for industrial progress.

The function of the PIDC is to establish those industries specified by its charter, viz.: (1) jute mills; (2) paper mills and allied paper products; (3) fertiliser plants; (4) heavy engineering industries, including iron and steel; (5) shipbuilding; (6) cement plants; (7) textiles; (8) sugar; (9)

[1] W. A. Robson, *Problems of Nationalized Industry*, 1952.

natural gas; (10) heavy chemicals; (11) chemicals, pharmaceuticals and dyestuffs; and (12) development of power from Sui gas.

While basic industries certainly dominate the list, consumer-goods industries, such as paper, textiles and sugar, also figure prominently. The obvious reason for this is that Pakistan is almost equally backward in the sphere of light industries. At the time of the partition of India in 1947 those areas now known as Pakistan had hardly any industrial activity worthy of the name. Though West Pakistan was an area rich in raw cotton, in the whole of Pakistan there were only a few cotton mills with a total strength of 177,418 spindles and 4,824 looms. By the end of June 1954 their number had risen to 923,876 and 14,484 respectively. By the end of June 1955 there had been another remarkable rise in the installed capacity, the number of spindles increasing to 1,565,552 and that of looms to 22,633.[1] Within a year the output of cotton cloth rose by about 26%, from 306 million yards in 1953–54 to 386 million yards in 1954–55. The quantity of surplus yarn actually spun rose by more than 74% during the same period, from 74 million to 128 million lb.[2]

It is not suggested that the entire credit for this progress is attributable to the PIDC. In fact, in the domain of cotton textiles the PIDC has not much to take credit for. But it may be pointed out that the Government of Pakistan have found in the PIDC an agency that furnishes help through all difficulties. To take only one instance, the Government of East Pakistan started the construction of a cotton mill with a capacity of 4,000 spindles in Kaliganj in Dacca district. Finding themselves embarrassed, they requested the PIDC to take over this project and to carry out its management, even though a large part of the share capital was held by the East Pakistan Government.

By the end of June 1955 the PIDC had completed, in all, as many as nineteen projects, of which no fewer than fifteen were accomplished during the year 1954–55 alone. These fifteen projects include four jute mills in East Pakistan, one cotton mill at Dacca, two woollen mills at Harnai and Bannu, one sugar mill at Jauharabad, one caustic soda plant and one D.D.T. factory at Nowshera and one sulphuric acid plant at Lyallpur. In addition to this, four model ginning factories have been set up by the PIDC with a view to improving the standard of cotton ginning.

Over and above the nineteen projects already completed by the PIDC, twelve more are on the anvil. These include four new jute mills in East Pakistan, the Qaidabad woollen mills, two cement factories at Hyderabad (Sind) and Daudkhel, a high-grade paper mill at Amangarh, a straw-board mill at Rahwali, the Sui–Karachi gas pipe-line, the ammonium sulphate plant at Daudkhel and two sugar mills at Rangpur and Charsadda. The PIDC has also in view the setting up of a newsprint factory with an annual production capacity of 30,000 tons, an integrated iron and steel plant at Multan and a 100,000-kilowatt power-station also at Multan designed for the utilisation of Sui gas.

[1] *Report on Currency and Finance for 1954–55*, State Bank of Pakistan. [2] *Ibid.*

The institutional climate has apparently proved highly conducive to rapid industrial growth in Pakistan. The index of industrial production (1950 = 100) rose from 125 in 1951 to 160 in 1952, 235 in 1953 and 285 in 1954.[1] The PIDC is responsible in no small degree for this rapid progress. The most noteworthy development was in jute goods, the output of which rose from 40,150 tons in 1953–54 to 77,423 tons in 1954–55 (an increase of about 93% in one year). The output of different varieties of paper was more than doubled, reaching 20,898 tons in 1954–55, as against 9,495 tons in 1953–54. Certain items, such as D.D.T., sulphuric acid and caustic soda, were produced in Pakistan for the first time during the year 1954–55.

It may, however, be added that certain sectors of the industrial economy seem to have been neglected. For example, the production of steel ingots in Pakistan, which stood at the palpably low figure of 10,782 tons in 1953–54, actually declined to 9,455 tons in 1954–55. In the case of cement the output rose only from 618,000 to 681,000 tons during this period, registering a comparatively low rate of progress, viz., about 10%. Likewise, the increase in the production of sugar from 76,458 to 78,176 tons represented a rise of only about 2%. The increase in the generation of electrical energy from 447 million kilowatts in 1953–54 to 504 million kilowatts in 1954–55 amounted to an annual increase of a little less than 13%. This rate of growth in the generation of electrical power, though inadequate to meet the rising tempo of industrial activity in Pakistan, compares favourably with the 6% rise in coal production (from 562,000 tons in 1953–54 to 595,000 tons in 1954–55) and with an identical 6% increase in the output of crude petroleum (from 1,642,000 barrels in 1953–54 to 1,740,000 barrels in 1954–55).

The rising imports of machinery into Pakistan are evidence, first, of the fast pace of industrialisation, and secondly, of Pakistan's total backwardness in the sphere of capital-goods industries. The imports of machinery aggregated Rs. 13·68 crores (about £10 million) [2] in 1952–53, Rs. 16·60 crores (over £12 million) in 1953–54 and Rs. 31·85 crores (about £24 million) in 1954–55.

In the period since the establishment of the PIDC capital issues by industrial companies have stood at a fairly high figure. For the period 1947–52 the average annual rate of capital issues works out at Rs. 10·58 crores (£8 million). During the years 1953–55 capital issues have been sanctioned at an annual rate of over Rs. 25 crores (£19 million). However, on analysing the figures year by year for the period 1953–55, it will be seen that the curve of capital issues has definitely flattened. Capital issues amounted to Rs. 27.28 crores for 1953, Rs. 26·78 crores for 1954 and Rs. 12·86 crores for the first six months of 1955.

This suggests that the financial burdens of the new industrial projects are falling increasingly on the PIDC. The total capital outlay on all the pro-

[1] "White Paper on 1955–56 Budget," *Pakistan Trade*, May 1955, p. 15.

[2] In all these calculations the value of the Pakistani rupee has been taken as equal to the Indian rupee (which is the present position), even though, before the recent devaluation of the Pakistani rupee on July 31, 1955, the value of the Pakistani rupee was higher than that of the Indian rupee by about 44% (*i.e.*, 100 Pakistani rupees = 144 Indian rupees).

jects sponsored by the PIDC is estimated at Rs. 65·42 crores (£49 million). More than half of this amount, viz., Rs. 33·56 crores (£25 million), represents investment by the PIDC. The balance of Rs. 31·86 crores (£24 million) is accounted for as follows:

(i) private-enterprise contributions, Rs. 19·15 crores (over £14 million);

(ii) foreign aid Rs. 6·42 crores (£5 million);

(iii) World Bank loan for the Sui Gas Project Rs. 4·62 crores (£3½ million);

(iv) contribution of provincial governments Rs. 1·68 crores (£1¼ million).

The fact that the PIDC's contribution has aggregated Rs. 33·56 crores, whereas the Corporation's capital is only Rs. 1 crore, is an anomaly accounted for by the large grants budgeted every year by the Central Government of Pakistan. During the fiscal year 1955–56 the Central Government has provided for a sum of Rs. 15·10 crores (£11 million) for the PIDC. The revised budget estimates for 1954–55 showed an investment of Rs. 9·67 crores.[1]

The underlying objective of the PIDC is to encourage private enterprise and to work in collaboration with private capital wherever possible. The Corporation "sponsors public limited companies in which participation of private capital is attracted to the maximum possible extent. The objective is to see that mills and factories are set up . . . so essential to balance the economy of Pakistan, and wherever private capital is not forthcoming the Corporation gets the total capital from the Government to establish the industry, without loss of time." [2]

It is thus clear that the PIDC has no intention of extending the scope of nationalised industry in Pakistan. Even when an industry is established with the major part of the capital coming from Governmental contributions, the step is a matter of expediency rather than one based on socio-economic logic. It would not be surprising if many of the industrial units now floated by the PIDC with the active assistance of the Government are ultimately transferred to private enterprise at a later stage (when the solvency of such industrial units is clearly established and private industrialists are willing to take them over). Such an institutional pattern would be comparable to the industrial system of Japan as it evolved soon after the Meiji Restoration—where industrial units were initially sponsored through state initiative, but were gradually handed over to private entrepreneurs.

III. In India

The birth of industrial development corporations in India is a later event. This is obviously attributable to the comparatively high level of industrial activity obtaining in India even before the era of economic planning actually set in. Moreover, in recent years the Government of India, has embarked on

[1] *Report on Currency and Finance for 1954–55*, State Bank of Pakistan.

[2] Cf. the speech of Mr. M. A. Ispahani, director PIDC, broadcast from the Dacca Station of Radio Pakistan on October 21, 1954.

an extension of the field of state enterprise, not on grounds of expediency, but on the basis of a doctrinaire belief in the inherent superiority of a socialised industrial system.

It was not until India's First Five Year Plan, initiated in 1951, had proceeded more than half-way that the inadequacy of public investment (for meeting the requirements of planned targets) was realised. This brought home to the industrial planners the urgent necessity of yoking private enterprise, with its full strength, in the service of economic planning.

The Committee on Finance for the Private Sector, appointed by the Reserve Bank of India under the chairmanship of Mr. A. D. Shroff, a well-known industrial magnate, submitted its report in 1954. The Committee's findings were that during the past few years the socio-economic climate in India has tended to discourage and discredit private enterprise. It strongly expressed itself in favour of an assurance from the Government granting immunity from nationalisation for scheduled industries for a reasonable period.[1] The Committee deprecated the growing tendency to grant unfair concessions to publicly-owned industrial units. It also felt that private investment had been delayed and retarded by the bewildering complications in the procedure for granting licences to private enterprises. It suggested that Government Departments should have technical specialists whose duty it would be to help private entrepreneurs in the completion of details and in fulfilling statutory requirements. While expressing the view that the mere multiplication or strengthening of agencies will not add to the country's industrial development, the Shroff Committee recommended the establishment of three development corporations[2]:

(1) a state-owned Industrial Development Corporation;

(2) a privately-owned Industrial Development and Finance Corporation;

(3) a special Development Corporation for Small Industries.

All these three Corporations have since been established. The first one, styled the National Industrial Development Corporation Ltd. (NIDC), was established on October 20, 1954. The second was registered on January 5, 1955, under the name of Industrial Credit and Investment Corporation of India Ltd.[3] And finally, the National Small Industries Corporation Ltd.

[1] The importance of such an assurance can possibly be better appreciated now after the nationalisation of the entire life-insurance business in India on January 19, 1956, under the Life Insurance (Emergency Provisions) Ordinance, 1956, issued by the President. No opportunity was given to the Parliament to debate this issue before a decision was arrived at.

[2] The Shroff Committee also recommended that a Central Organisation for technical and managerial assistance to industries should be set up jointly by the Government, special financial institutions like the Industrial Finance Corporation and private industries.

[3] For want of space, discussion in this paper will be confined to the publicly-owned Industrial Development Corporation (NIDC). The Industrial Credit and Investment Corporation of India Ltd. is a privately-sponsored institution registered under the Indian Companies Act. The authorised capital of the Corporation is Rs. 25 crores (£19 million), though the issued capital is only Rs. 5 crores (about £4 million). The shares of the Corporation were granted the status of "approved investment" for the purpose of § 27-A of the Indian Insurance Act, 1938.

Of this amount a sum of Rs. 1 crore (£750,000) was subscribed by the British Eastern Exchange Banks and certain British and other Commonwealth insurance companies, and other British

was established in February 1955, with a view to assisting, financing and protecting small industries in India, and also to secure co-ordination between large-scale and small-scale industries so as to enable the latter to manufacture ancillaries, components and other articles required by the former.[1]

The structural pattern of the National Industrial Development Corporation (NIDC) differs materially from that of the Pakistan Industrial Development Corporation (PIDC). The PIDC was established under an Act of the Legislature. But the NIDC, though owned entirely by the Government of India, is merely a *private company* registered under the Indian Companies Act.

Both the PIDC and the NIDC have an authorised capital of Rs. 1 crore (£750,000) each, though in the case of the NIDC the paid-up capital is only Rs. 10 lakhs (£75,000). In both the cases the Board of Directors are nominated by the respective Governments. In both the cases seasoned industrialists have found a place on the Boards.

The NIDC will give priority to the manufacture of capital goods, machinery and equipment for other industries, and take up the study and investigation of industrial schemes. In implementing them it will try to secure, where possible, the maximum use of the industrial equipment, experience and skill available in the private sector. It might even set up industries which would in their turn lead to the growth of ancillary industries in the private sector.[2] The basic purpose of the NIDC is to encourage and aid medium- and large-scale industries, the development of which is necessary to fill in the gaps and thus make for the harmonious development of both the public and the private sectors in a planned economy. In broad outline the aims of the NIDC are " the promotion and establishment of industries for the manufacture and production of plant, machinery, implements and goods of any

companies. Certain nationals and corporations of the United States purchased shares of the value of Rs. 50 lakhs (£375,000). Thus 30% of the subscribed capital of the Corporation came from foreign sources. Out of the remaining, shares worth Rs. 2 crores (£1,500,000) were taken up by several Indian banks and insurance companies, and certain directors of the Corporation and their friends and associates. Shares worth Rs. 1·5 crores (£1,125,000) were offered for public subscription in India, and a prospectus was issued for the purpose in February 1955. This issue was oversubscribed. The shares were allotted on a fully-paid basis.

In March 1955 the Government of India advanced to the Corporation a sum of Rs. 7·5 crores (£5,625,000) free of interest repayable in fifteen equal annual instalments. About the same time, the International Bank agreed to lend to the Corporation an amount in various currencies equivalent to $10 million for the purchase of imported material, equipment and service. The repayment of the principal, interest and other charges on the loan has been guaranteed by the Government of India.

The Corporation commenced business on March 1, 1955, and its Statutory Report, published in July 1955, revealed that it had offered to provide substantial financial aid for two propositions—one of a new industrial venture and the other for the expansion of an existing industry. The Corporation's activities are confined to the private sector (mainly large- and medium-sized units).

Speaking at the statutory meeting held on July 28, 1955, Sir Ramaswami Mudaliar, Chairman of the Corporation, observed: " . . . the most tangible proof . . . of the intentions of the Government to see that private sector develops *pari passu*, and perhaps in a complementary way, with the public sector is in the co-operation that they have extended in a very substantial manner to the establishment of the Corporation."

[1] *Report on Currency and Finance*, Reserve Bank of India, Bombay, 1954–55, p. 51.

[2] *Ibid.*, p. 50.

description likely to promote the industrial development and to aid and assist any industrial undertaking owned by private companies also with capital and other resources for establishing new industries or for running their existing business." [1]

There is a striking similarity between the objectives of the NIDC and those of the PIDC. Both of them aim at encouraging private enterprise wherever possible. Moreover, the list of industries selected of its own volition by the NIDC for investigation and promotion partly overlaps the list of industries given in the charter and taken up by the PIDC. The NIDC has selected fourteen items, viz.: (1) manufacture of machinery and equipment; (2) ferro-alloys, ferro-manganese and ferro-chrome; (3) aluminium; (4) copper, zinc and other non-ferrous metals; (5) diesel engines (marine), locomotives and generators; (6) heavy chemicals; (7) fertilisers; (8) coke-oven and coal-tar products; (9) methanol formaldehyde; (10) carbon; (11) wood pulp for use in the manufacture of newsprint and other paper, rayon, etc.; (12) synthetic drugs, vitamins and hormones; (13) X-ray and medical equipment; and (14) hardboard, insulation board, etc.

The NIDC is expected to assume special responsibility for laying the foundations of heavy industry in forgings and fabricated steel structurals. It has undertaken the investigation of a scheme in this connection. The project, however, will lie in the public sector, and will be financed out of the sum of Rs. 70 crores (£53 million) allotted to the NIDC by the Planning Commission.[2] Thus the financial structure of the NIDC may be very similar to that of the PIDC, which depends for its working on annual allotments by the Government of Pakistan.

The Government of India are not only to provide finance; they may also procure for the NIDC foreign collaboration on the lines of the Rourkela Steel Project (where, by virtue of an agreement arrived at in December 1952 the German firm of Krupps and Demag is to assist the Government of India in

[1] *Commerce* (Bombay), October 30, 1954, p. 827.

[2] Disclosed by Mr. T. T. Krishnamachari, Union Minister for Commerce and Industry, while speaking at the meeting of the National Development Council held in New Delhi on January 21, 1956. Out of Rs. 70 crores provided in the draft of the Second Five Year Plan (1956–61) for the NIDC a sum of Rs. 25 crores (£19 million) had been earmarked for the rehabilitation of jute and cotton textile machinery. "It has been suggested that the amount might be stepped up so as to enable us to establish those very necessary units for the purpose of building heavy machinery during the second plan."

"The idea is," Mr. Krishnamachari observed, "that we should start three big forges and foundries and ancillary equipment for the purpose alongside with the three steel plants [which the Government are planning to establish with the technical co-operation of the Germans, the Russians and the British respectively]. If a change of venue is desirable, it can be considered, but the board of directors of the National Industrial Development Corporation felt that these plants must be located near the steel plants and that they should not be far away."

Mr. Krishnamachari indicated that India might be able to manufacture 60–70% of her heavy machinery (fabrication plants) requirements by the beginning of the Third Five Year Plan (*i.e.*, 1961). He expressed the hope that the state-owned steel plants would start working in the middle of 1959, though "we will not be able to achieve full production until we are right on to 1960."

Out of 1 million tons of "fabricated produce" that India expects to produce, the expansion in the private sector may account for 450,000–500,000 tons, while the public sector may account for something between 500,000 and 550,000 tons.

establishing a state-owned steel plant to be situated at Rourkela in Orissa state).

It is estimated that during the Second Five Year Plan (started on April 1, 1956) the demand for castings will be at least 17,000 tons; while the demand for structurals—needed for the building of workshops, power-houses, hangers, bridges, wagons, coke-oven plants, etc.—may stand at 450,000 tons per year.[1] At present India is woefully deficient in respect of these items. The establishment of new capacity for producing castings, forgings and fabrications will also help to develop industries like heavy machine tools, printing machinery, diesel engines, heavy electrical equipment, steel plants, cement and sugar machinery and heavy earth-moving machinery.

At the first meeting of the Board of Directors of the NIDC it was decided that the Corporation should have a nucleus of three or four general engineers with wide experience who would advise the Corporation on all technical problems coming before them and also on the choice of suitable consulting and design engineers for preparing specific projects to be undertaken by the Corporation. The Board also felt that there was a need in India for a competent firm of consulting engineers whose services could be utilised not only by the Corporation but also by private industry whenever required. The only way this could be arranged, in their view, was to invite a firm of international repute to open their offices in this country. In the initial stages it might be necessary to offer a minimum retainer fee, as the work of such a firm of technical advisers might not be commercially profitable at the outset. To begin with, the services of a German expert have been procured by the Corporation to start investigation on the wood-pulp industry.

In respect of the industries chosen by the Corporation, its line of action will be first to examine the progress made so far, then to consider their immediate needs and, finally, to forecast their future potentialities. In the case of those industries where adequate progress has already been recorded by private and public enterprises, *e.g.*, aluminium and fertilisers, the Corporation will not compete or interfere. It will step in only if any further assistance or action is required. The ferro-manganese industry is another instance where the Corporation will not interfere if the propositions submitted by private enterprise (and approved by the Government) mature.

The NIDC is to lay special emphasis on the utilisation of waste products and the development of resources in raw materials. This will require high-level technical investigations and scientific researches. The Corporation has rightly included coke-oven and coal-tar products, and wood pulp for use in the production of rayon, paper and newsprint in its list for study.

In short, the functions of the NIDC, may be classified as four-fold. In the first instance, the Corporation will study, investigate and formulate projects either for the establishment of new undertakings or for starting fresh lines of production in existing undertakings. Secondly, it may co-operate with private enterprise in launching new industries or in embarking on fresh productive lines in existing industries. Thirdly, the Corporation is to act as

[1] The United Commercial Bank Limited, Calcutta, *Fortnightly Business Letter*, January 16, 1956.

a reservoir of technically trained staff to serve as technical consultants for Indian industries. Lastly—and possibly this is the most difficult part—the Corporation may set up new industrial enterprises on its own account.

The last function of the Corporation merits some discussion. Will the Corporation own and manage such industrial units permanently? If so, will not this entail locking up its resources in a few enterprises and then bringing its activities to a standstill? Moreover, is the Corporation in any position (with its present resources in men and finance) to start and run any of the big industrial projects? Experience so far merely goes to show that the NIDC—unlike the PIDC—is just an arm-chair body with little executive enterprise. Of course, the period of its existence has been too short to warrant any sweeping assertion.

Nevertheless, it is interesting to speculate about some of the diverse alternative courses which the Corporation may adopt to manage its newly-sponsored enterprises. It may, as the line of least resistance, negotiate with the Ministry of Production, Government of India, to take over such enterprises (to be managed departmentally, like the Sindri Fertilizers and Chemicals Ltd.). If that be so, the Ministry of Production might as well promote such new enterprises, and there would obviously not be much point in having a separate development corporation like the NIDC.

There are two alternatives definitely more practical than the above. For each of its babies, the Corporation may either create a subsidiary company or, through the good offices of the Government of India and the Parliament, succeed in creating a public corporation for each undertaking or set of undertakings. In either case, the new industrial units have a greater chance of being managed efficiently and independently (even though under public ownership). The creation of subsidiaries is easier, though it would make the Corporation, as a holding company, a very cumbersome institution. The creation of public corporations is preferable, but the Government, for political reasons, may stand in the way of multiplying their number.

The last alternative before the NIDC is the one that the PIDC obviously has in view, viz., the ultimate handing over of newly established industries to private enterprise. But it may be pointed out that in view of the prevailing socio-economic ideologies such a course has little chance of acceptance by the party in power. The transference of publicly sponsored enterprises to private hands may easily become a political scapegoat in India. Moreover, such a step may not be commercially feasible. Private entrepreneurs may readily take over the highly profitable enterprises. But the less-paying or non-paying propositions would be the prodigal sons of the Corporation whom no entrepreneur would want to adopt. If the Corporation retains all the enterprises—profitable ones and unprofitable ones—it can at least bring about a balance. But if it decides to part with the profitable ones, it will saddle itself with the burden of recurring deficits. The situation would be less difficult if in the Corporation's portfolios, the more profitable enterprises are predominant.

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DEVALUATION, A MARRIAGE OF THE ELASTICITY AND THE ABSORPTION APPROACHES[1]

1. *Engagement But Not Yet Marriage*

THE elasticities and the absorption approaches to international-trade theory have been engaged but not yet married. Recent model builders of great prominence [2] have made import demand a function of two things, *i.e.*, the level of real output and the *ratio* between the price of imports and the price of domestically-produced goods. This is a great advance compared with the pure elasticities or the pure absorption approaches, but for the following reason it cannot be considered a final marriage. Compare the situation in which the price of domestically-produced goods drops by 1% with the situation in which the price of imports rises by 1%. Unquestionably the new ratio between the prices of imports and domestically-produced goods will be the same in both situations, but with unchanged real output and factor prices, real income is up in the former case but down in the latter. Recently, criticism along such lines has been very well made by Beckerman in Britain and Machlup in this country.[3]

Inspired by Beckerman's and Machlup's criticisms and the lack of response to them, the present paper attempts to take another step toward the final wedding ceremonies. A two-country model is set up in which each country produces only one commodity and in which output in each country is determined by effective demand originating at home and abroad for that country's commodity. To keep the presentation simple, employment ceilings, a constraint on any effective-demand model, are ignored. Where the

[1] Howard S. Ellis (California) encouraged my work on this problem. Sven Danö and Arne Nielsen (both of Copenhagen), and J. M. B. Moss (Cambridge, England) checked my mathematics. Mr. J. Black, Magdalen College, Oxford, rechecked it and offered substantial suggestions for improvement. For all this, I express my sincere thanks.

[2] This group includes Arnold C. Harberger, "Currency Depreciation, Income, and the Balance of Trade," *The Journal of Political Economy*, Vol. LVIII, No. 1 (February 1950), pp. 47–60, but cf. his appendix; Svend Laursen and Lloyd Metzler, "Flexible Exchange Rates and the Theory of Employment," *The Review of Economics and Statistics*, Vol. XXXII, No. 4 (November 1950), pp. 281–99; J. J. Polak, *An International Economic System* (The University of Chicago Press, 1953), particularly pp. 37 and 52; and Harry G. Johnson, "Increasing Productivity, Income-Price Trends and the Balance of Trade," this JOURNAL, Vol. LXIV, No. 255 (September 1954), pp. 462–85.

[3] G. L. Rees, "Price Effects and the Foreign Trade Multipliers," *The Review of Economic Studies*, Vol. XX (3), No. 33 (1952–53), pp. 228–31, had unsuccessfully tried to give a literary exposition of the problem of price effects upon the trade balance. He made a major analytical error in using "real income" very loosely in a model in which prices are variable. As pointed out by W. Beckerman, "A Note on Variable Prices and Foreign Trade Multipliers," *The Review of Economic Studies*, Vol. XXI (2), No. 55 (1953–54), pp. 162–4, real income depends upon the relative price of imports and upon the weights given to import prices and home prices. Criticising S. S. Alexander, "Effects of a Devaluation on a Trade Balance," *International Monetary Fund Staff Papers* (April 1952), II, p. 266, Machlup, "Relative Prices and Aggregate Spending in the Analysis of Devaluation," *The American Economic Review* Vol. XLV, No. 3 (June 1955), pp. 268–9, made a similar statement.

employment ceiling is felt to be important, the traditional full-employment elasticities approach will do. By distinguishing between a business sector selling goods and a household sector selling factors it becomes possible for us to distinguish between money income, which is factor input times the price of factors, and real income, which is money income divided by the price of goods demanded. Import demand as well as demand for domestically-produced goods are made a function of real income. The model has been simplified and brought somewhat closer to reality by not making the ubiquitous assumption of pure competition. This removes supply curves entirely and makes room for the notion that prices are administered and can be taken for parameters. Firms (and countries) simply produce whatever is demanded at the going price. Once the solution of the system has been established, the effect of price and exchange-rate changes can be studied as a matter of simple calculus.

2. *The Model*

Apply the distinction between *ex ante* and *ex post* to a six-sector Leontief model whose variables are:

X_j = output of goods produced by sector j, in physical number of goods per unit of time.

x_{ij} = purchase of product or factor of sector i by sector j, in physical number of goods or factors per unit of time.

σ_{ij} = sale of product or factor of sector i to sector j. Dimension: same as x_{ij}.

An asterisk preceding a variable means that the value of that variable is the *ex-ante* value. Absence of an asterisk means that the value is the *ex-post* value. The subscripts f, g and h referring to domestic firms, government and households, respectively, and the subscripts F, G and H referring to foreign firms, government and households, respectively, we have the ten transactions of goods and factors tabulated in Table I. International purchases other than those made by households from firms are ignored. Government purchases goods from the firms of its own country and receives the proceeds of tariff duties. The latter are not included in Table I, because they do not represent transactions of goods or factors.

TABLE I

Planned Purchase of Goods and Factors

Purchasing from: \ Purchases planned by:	Domestic firms.	Domestic government.	Domestic households.	Foreign firms.	Foreign governments.	Foreign households.
Domestic firms	$*x_{ff}$	$*x_{fg}$	$*x_{fh}$	—	—	$*x_{fH}$
Domestic government	—	—	—	—	—	—
Domestic households	$*x_{hf}$	—	—	—	—	—
Foreign firms	—	—	$*x_{Fh}$	$*x_{FF}$	$*x_{FG}$	$*x_{FH}$
Foreign government	—	—	—	—	—	—
Foreign households	—	—	—	$*x_{HF}$	—	—

Of the ten transactions, two are intra-sector, eight are inter-sector transactions. As to the former, in good Keynesian tradition the investment volumes at home and abroad, $*x_{ff}$ and $*x_{FF}$, respectively, are used for parameters. The same is true of government expenditure on goods at home and abroad, $*x_{fg}$ and $*x_{FG}$. In good Leontief tradition, the factor demands at home and abroad, $*x_{hf}$ and $*x_{HF}$, respectively, are assumed to be in direct proportion to planned output at home and abroad, respectively. This leaves us with four transactions representing household demand for goods. In our four demand equations, money illusions have been purged. And now for the details. A complete list of all parameters used below is found in the appendix.

3. *Planned Purchases, Domestic Behaviour Equations*

There are three behaviour equations determining domestic planned purchases. First, planned purchases of domestic factors by domestic firms are assumed to be in direct proportion to planned domestic output:

$$*x_{hf} = a_{hf} *X_f \tag{1}$$

Turning to demand, planned purchases of domestic goods by domestic households are the following function:

$$*x_{fh} = a_{fh}\left[\frac{*\sigma_{hf}\pi_h}{\pi_f}\right]^{e_{fh}}\left[\frac{*\sigma_{hf}\pi_h}{\pi_F\rho t}\right]^{E_{fh}} \tag{2}$$

where the elasticity of domestic demand for domestic goods is e_{fh} with respect to expected, real, personal, domestic income in terms of domestic goods, and is E_{fh} with respect to expected, real, personal, domestic income in terms of foreign goods. The elasticity with respect to expected, money, personal income is, then, $e_{fh} + E_{fh}$, which we shall assume to be equal to unity.

Third, planned purchases of foreign goods by domestic households are assumed to be the following function:

$$*x_{Fh} = a_{Fh}\left[\frac{*\sigma_{hf}\pi_h}{\pi_f}\right]^{e_{Fh}}\left[\frac{*\sigma_{hf}\pi_h}{\pi_F\rho t}\right]^{E_{Fh}} \tag{3}$$

where the elasticity of domestic demand for foreign goods is e_{Fh} with respect to expected, real, personal, domestic income in terms of domestic goods, and is E_{Fh} with respect to expected, real, personal, domestic income in terms of foreign goods. The elasticity with respect to expected, money, personal income is, then, $e_{Fh} + E_{Fh}$, which we shall assume to be unity.

The result that the money-income elasticity is the sum of the two real-income elasticities in terms of domestic and foreign goods, respectively, is a consequence of our purging the money illusion. To make this consequence perfectly clear, the reader might, perhaps, be asked to perform the following three hypothetical operations.

First, reduce the price π_f of domestic goods by 1%. Domestic, real, personal income in terms of domestic goods will then have risen by 1%. According to (2), domestic demand for domestically-produced goods, $*x_{fh}$, will then change by e_{fh}%, and according to (3), domestic demand for foreign-produced goods, $*x_{Fh}$, will change by e_{Fh}%.

Second, reduce the price π_F of foreign goods by 1%. Domestic, real, personal income in terms of foreign goods will then have risen by 1%. According to (2), domestic demand for domestically-produced goods, $*x_{fh}$, will then change by E_{fh}%, and according to (3), domestic demand for foreign-produced goods, $*x_{Fh}$, will change by E_{Fh}%.

Third, suppose that we had not taken steps Number One and Two but had instead raised domestic, money, personal income by 1% and kept all prices constant. According to (2), domestic demand for domestically-produced goods, $*x_{fh}$, would then have risen by $e_{fh} + E_{fh}$%, and according to (3), domestic demand for foreign-produced goods, x_{Fh}, would have risen by $e_{Fh} + E_{Fh}$%.

Our real income elasticities are, of course, nothing but price elasticities (including income effects) with opposite signs. For example, if domestic demand elasticity of import with respect to domestic real income in terms of foreign goods is defined, as we have done, as E_{Fh}, then we can write the simple price elasticity of domestic demand for imports as $-E_{Fh}$; likewise, we can write the cross elasticity of domestic demand for imports with respect to the price of domestic goods as $-e_{Fh}$. When aggregation has been driven to the point where there are only two commodities, domestic and imported, the income effects of a change of the price of any of the two commodities must be substantial. Hence our use of the term " real-income " elasticities rather than " price " elasticities.

4. *Planned Purchases, Foreign Behaviour Equations*

There are three similar behaviour equations determining foreign planned purchases. First, planned purchases of foreign factors by foreign firms are assumed to be in direct proportion to planned foreign output:

$$*x_{HF} = a_{HF} *X_F \tag{4}$$

Second, planned purchases of foreign goods by foreign households are assumed to be the following function:

$$*x_{FH} = a_{FH}\left[\frac{*\sigma_{HF}\pi_H}{\pi_f \frac{T}{\rho}}\right]^{e_{FH}}\left[\frac{*\sigma_{HF}\pi_H}{\pi_F}\right]^{E_{FH}} \tag{5}$$

where the elasticity of foreign demand for foreign goods is e_{FH} with respect to expected, real, personal, foreign income in terms of domestic goods, and is E_{FH} with respect to expected, real, personal, foreign income in terms of foreign goods. We assume that the money income elasticity $e_{FH} + E_{FH} = 1$.

Third, planned purchases of domestic goods by foreign households are assumed to be the following function:

$$*x_{fH} = a_{fH}\left[\frac{*\sigma_{HF}\pi_H}{\pi_f \frac{T}{\rho}}\right]^{e_{fH}}\left[\frac{*\sigma_{HF}\pi_H}{\pi_F}\right]^{E_{fH}} \tag{6}$$

where the elasticity of foreign demand for domestic goods is e_{fH} with respect to expected, real, personal, foreign income in terms of domestic goods, and

is E_{fH} with respect to expected, real, personal, foreign income in terms of foreign goods. We assume that the money income elasticity $e_{fH} + E_{fH} = 1$.

To domestic and foreign consumers alike, domestic and foreign goods are assumed to be substitutes. Consequently, the elasticities e_{fh}, E_{Fh}, E_{FH} and e_{fH} are always positive, for the income and substitution effects pull in the same direction. As to the elasticities E_{fh}, e_{Fh}, e_{FH} and E_{fH}, they may be positive or negative; here, income and substitution effects pull in opposite directions. But to some extent we have already committed ourselves: from our assumption that income elasticities are always unity it follows that only if e_{fh}, E_{Fh}, E_{FH} or e_{fH} are in excess of unity will E_{fh}, e_{Fh}, e_{FH} or E_{fH}, respectively, be negative. And now four parameters.

5. *Planned Purchases, Parameters*

Planned purchases of domestic goods by domestic government, as well as planned purchases of foreign goods by foreign government, are assumed to be parameters:

(7) $\quad {}^*x_{fg} = \text{a parameter}$

(8) $\quad {}^*x_{FG} = \text{a parameter}$

6. *Expected Investment, Parameters*

Expected gross private investment by domestic firms, as well as expected gross private investment by foreign firms, are assumed to be parameters, too:

(9) $\quad {}^*x_{ff} = \text{a parameter}$

(10) $\quad {}^*x_{FF} = \text{a parameter}$

7. *Purchase Plans Are Always Realised*

In a buyer's market plans made at the beginning of the period are carried out during the period. For each of our eight inter-sector transactions we can express that planned purchases equal realised purchases:

(11) through (18) $\quad {}^*x_{ij} = x_{ij}$

where ij represents fh, fH, hf, fg, Fh, FH, HF and FG respectively.

8. *Production Plans Are Always Realised*

In a buyer's market it can also be assumed that well-planned production processes will be realised:

(19) $\quad {}^*X_f = X_f$

(20) $\quad {}^*X_F = X_F$

9. *What Is Purchased Is Sold*

Any sector's realised purchases from another sector constitutes the latter's realised sales to the former. This is true of any of our eight inter-sector transactions:

(21) through (28) $\quad x_{ij} = \sigma_{ij}$

where ij has the same alternative meanings as in Section 7.

10. *Equilibrium Conditions*

If equilibrium is to prevail, the activity of the two economies must be self-justifying in the sense that any sector's expected sales to another must equal realised sales. This is true of any of our eight inter-sector transactions:

(29) through (36) $$*\sigma_{ij} = \sigma_{ij}$$

where ij has the same alternative meanings as in Section 7.

11. *Definitional Equations*

By definition, domestic expected gross private investment is that part of domestic output that domestic firms do not expect to sell to domestic or foreign households or governments.

(37) $$*x_{ff} = *X_f - (*\sigma_{fh} + *\sigma_{fH} + *\sigma_{fg})$$

Also by definition, foreign expected gross private investment is that part of foreign output that foreign firms do not expect to sell to foreign or domestic households or governments.

(38) $$*x_{FF} = *X_F - (*\sigma_{FH} + *\sigma_{Fh} + *\sigma_{FG})$$

12. *Solutions*

Our unknowns are: two expected investments $*x_{ff}$ and $*x_{FF}$; eight planned purchases $*x_{ij}$; eight realised purchases x_{ij}; eight expected sales $*\sigma_{ij}$; eight realised sales σ_{ij}; two planned outputs $*X_j$; and two realised outputs X_j. To determine these thirty-eight unknowns we have now written down thirty-eight equations. Before solving the system we shall introduce six convenient agglomerations of our parameters, *i.e.*,

$$m_1 = 1 - a_{fh}a_{hf}\pi_h[\pi_f]^{-e_{fh}}[\pi_F\rho t]^{-E_{fh}}$$

$$m_2 = a_{fH}a_{HF}\pi_H\left[\pi_f\frac{T}{\rho}\right]^{-e_{fH}}[\pi_F]^{-E_{fH}}$$

$$m_3 = a_{Fh}a_{hf}\pi_h[\pi_f]^{-e_{Fh}}[\pi_F\rho t]^{-E_{Fh}}$$

$$m_4 = 1 - a_{FH}a_{HF}\pi_H\left[\pi_f\frac{T}{\rho}\right]^{-e_{FH}}[\pi_F]^{-E_{FH}}$$

$$m_5 = \frac{E_{fh}(m_1 - 1) - E_{Fh}m_1}{m_1m_4 - m_2m_3}$$

$$m_6 = \frac{e_{fH}m_4 - e_{FH}(m_4 - 1)}{m_1m_4 - m_2m_3}$$

Using these expressions we can solve for national outputs:

$$X_f = \frac{m_2(*x_{FF} + *x_{FG}) + m_4(*x_{ff} + *x_{fg})}{m_1m_4 - m_2m_3}$$

$$X_F = \frac{m_1(*x_{FF} + *x_{FG}) + m_3(*x_{ff} + *x_{fg})}{m_1m_4 - m_2m_3}$$

13. *Economic Interpretation of the Constants m_1 through m_4*

Fortunately, very simple interpretations of the *m*s are possible. First m_1. From equations (1), (2), (13), (23) and (31) we get

$$m_1 = 1 - \frac{{}^*x_{fh}}{{}^*X}$$

or One *minus* planned purchases of domestic consumers' goods by domestic households per unit of domestic planned national output.

Next m_2. From equations (4), (6), (17), (27) and (35) we can get

$$m_2 = \frac{{}^*x_{fH}}{{}^*X_F}$$

or simply planned purchases of domestic consumers' goods by foreign households per unit of foreign planned national output.

Next m_3. From equations (1), (3), (13), (23) and (31) we can get

$$m_3 = \frac{{}^*x_{Fh}}{{}^*X}$$

or simply planned purchases of foreign consumers' goods by domestic households per unit of domestic planned national output.

Finally, m_4. From equations (4), (5), (17), (27) and (35) we can get

$$m_4 = 1 - \frac{{}^*x_{FH}}{{}^*X_F}$$

or One *minus* planned purchases of foreign consumers' goods by foreign households per unit of foreign planned national output.

14. *The Signs of the Constants m_5 and m_6*

The constants m_5 and m_6 are agglomerations of the first four *m*s, and no simple economic interpretation is possible for them. But for our policy conclusions their signs will turn out to be of crucial importance, so let us examine them closer.

The first thing we notice is that the two constants have the same denominator. The denominator is $m_1m_4 - m_2m_3$, and this magnitude can be shown to be normally positive. Temporarily, let us introduce two new ratios

$$n_2 = \frac{{}^*x_{fH}}{{}^*X}$$

$$n_3 = \frac{{}^*x_{Fh}}{{}^*X_F}$$

From the definitions of n_2, n_3, m_2 and m_3 it follows that

$$m_2m_3 = n_2n_3$$

Now express

$$m_1 - n_2 = 1 - \left(\frac{{}^*x_{fh}}{{}^*X_f} + \frac{{}^*x_{fH}}{{}^*X_f}\right)$$

If domestic autonomous investment, ${}^*x_{ff} + {}^*x_{fg}$, whether private or government, is positive it follows from equation (37) that ${}^*x_{fh} + {}^*x_{fH}$ is

less than $*X_f$. Consequently, $m_1 - n_2$ is positive, and $m_1 > n_2$. Then express

$$m_4 - n_3 = 1 - \left(\frac{*x_{FH}}{*X_F} + \frac{*x_{Fh}}{*X_F}\right)$$

If foreign autonomous investment, $*x_{FF} + *x_{FG}$, whether private or government, is positive it follows from equation (38) that $m_4 - n_3$ is positive and that $m_4 > n_3$. But if $m_1 > n_2$, then $m_1 n_3 > n_2 n_3$, and since $m_4 > n_3$ we have

$$m_1 m_4 > n_2 n_3 = m_2 m_3$$

In other words, the common denominator, $m_1 m_4 - m_2 m_3$, of the constants m_5 and m_6 is positive. Next let us look at the numerators, first m_5.

Beginning with the last term of the numerator of m_5, we know that m_1 and E_{Fh} are always positive. Turning to the first term, we also know that m_1 is positive and less than one. Consequently, $(m_1 - 1)$ is negative. E_{fh} can be positive or negative, and here is where our difficulties begin. Let us assume, very realistically, that in both countries neither imported goods as a whole nor domestically-produced goods as a whole are inferior. Let us furthermore assume, also quite realistically, that in both countries imported goods as a whole are mildly substitutable for domestically-produced goods. In that case our discussion of signs can very conveniently be cast in terms of the Hicksian income and substitution effects. If in the domestic market for consumers' goods the income effect is large relative to the substitution effect, E_{fh} would be positive. This would mean that a rising price of foreign-produced goods would *reduce* domestic consumption of domestically-produced goods, cf. Fig. 1. In such circumstances the entire numerator of m_5 would be unequivocally negative, and since the denominator is always positive, m_5 would be unequivocally negative. On the other hand, if the income effect were small relative to the substitution effect, E_{fh} would be negative. A rising price of foreign-produced goods would, then, *increase* domestic consumption of domestically-produced goods, cf. Fig. 2. Here, m_5 could, but would not have to, be positive.

Next, the numerator of m_6. We know that e_{fH} and m_4 are always positive, so the first term is always positive. Since m_4 is less than One, $(m_4 - 1)$ is negative. When discussing the sign of e_{FH} we again run into our difficulties. If in the foreign market for consumers' goods there is a large income effect relative to the substitution effect, e_{FH} would be unequivocally positive. This would mean that relative cheapening of domestic goods would *raise* foreign consumption of foreign-produced goods. Hence the entire numerator of m_6 would be positive. Since the denominator is positive, m_6 would be unequivocally positive. Vice versa, if the income effect were small relative to the substitution effect, m_6 could be, but would not have to be, negative.

15. *Application of the Model to Public Policy*

In the following sections we shall study the effects upon international trade, all international repercussions taken into account, of manipulating

the domestic parameters of the model. The effects will be described in the following terms. First, we shall find the elasticity, call it (I), of the value $\pi_f m_2 X_F/\rho$ of domestic export in foreign monetary units with respect to any

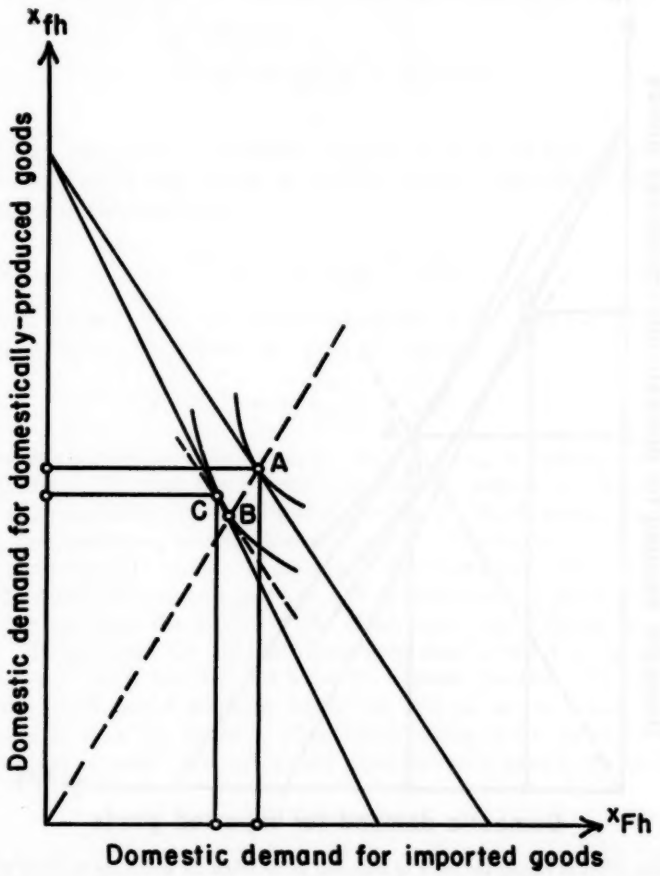

FIG. 1.—The effect of raising the price of imported goods. Optimum point moves from *A* to *C*. The domestic demand for domestically-produced goods is reduced, so E_{fh} is positive. Since the goods are relatively poor substitutes, the income effect *AB* is large compared to the substitution effect *BC*.

parameter, say t. Next we shall find the elasticity, call it (II), of the value $\pi_F m_3 X_f$ of domestic import in foreign monetary units with respect to the same parameter. Finally we shall define the ratio

$$R = \frac{\pi_f m_2 X_F/\rho}{\pi_F m_3 X_f}$$

i.e., the ratio between export value and import value. We shall then find the elasticity of R with respect to the parameter, say t. According to the

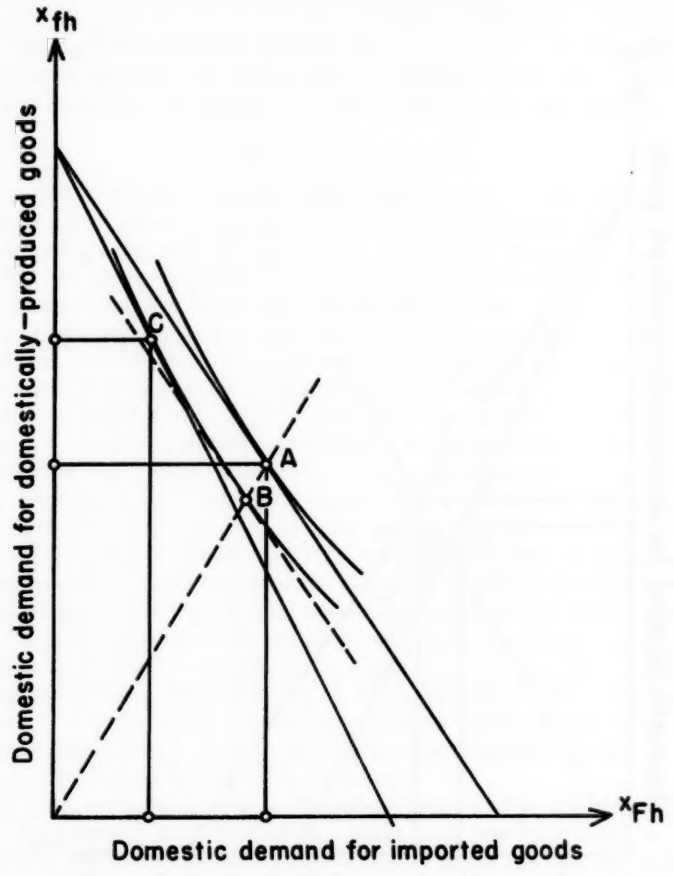

FIG. 2.—The effect of raising the price of imported goods when the goods are excellent substitutes for one another. Optimum point moves from A to C. Now the domestic demand for domestically-produced goods rises, so E_{fh} is negative. Since the goods are such excellent substitutes, the income effect AB is small compared to the substitution effect BC.

familiar technique of logarithmic derivation (R. G. D. Allen, *Mathematical Analysis for Economists*, 10.2, p. 246), this elasticity is

$$\frac{dR}{dt}\frac{t}{R} = t\frac{d(\log R)}{dt} = \text{(I)} - \text{(II)}$$

The difference (I) — (II) we shall call the " net effect " of the manipulation of the parameter.

16. *Tariff Policy*

Let us begin with the oldest form of balance-of-trade policy, *i.e.*, tariff policy. The elasticity of the value $\pi_f m_2 X_F/\rho$ of domestic exports in terms of foreign monetary units with respect to the domestic tariff is

$$\text{(I)} \qquad \frac{d\left[\frac{\pi_f m_2 X_F}{\rho}\right]}{dt} \frac{t}{\frac{\pi_f m_2 X_F}{\rho}} = \frac{X_f}{X_F} m_3 m_5$$

Likewise, the value of domestic imports in terms of foreign monetary units can be written very briefly as $\pi_F m_3 X_f$, and the elasticity of that value with respect to the tariff ratio is

$$\text{(II)} \qquad \frac{d(\pi_F m_3 X_f)}{dt} \frac{t}{\pi_F m_3 X_f} = m_4 m_5$$

To find the net effect, use the interpretation of the constants m_1 through m_4 given in section 13, deduct (II) from (I) and get

$$\text{(I)} - \text{(II)} = m_5 \left(\frac{{}^*x_{Fh}}{{}^*X_F} + \frac{{}^*x_{FH}}{{}^*X_F} - 1 \right)$$

If foreign autonomous investment, ${}^*x_{FF} + {}^*x_{FG}$, is positive, it follows from equation (38) that the parenthesis above is negative. Now a large income effect relative to the substitution effect in the domestic market, as we have seen, makes m_4 unequivocally negative. Consequently, (I) and (II) are negative but (I) − (II) is positive. Economically, this means that raising the tariff will reduce export as well as import value, but it will reduce the former less than the latter, so the effect upon the balance of trade is positive. If, however, the income effect were small relative to the substitution effect m_5 could, but did not have to, become positive. In that case, raising the tariff would increase export as well as import value, but the latter more so than the former. One contributing factor in either case is the absorption of tariff revenues by the government imposing the tariff.

17. *Devaluation*

Now let us turn to manipulations of the exchange rate. The elasticity of the value of domestic export in terms of foreign monetary units with respect to the exchange rate is

$$\text{(III)} \qquad \frac{d\left[\frac{\pi_f m_2 X_F}{\rho}\right]}{d\rho} \frac{\rho^2}{\pi_f m_2 X_F} = \frac{X_f}{X_F} m_3 m_5 + m_1 m_6 - 1$$

And the elasticity of the value of domestic import in terms of foreign monetary units with respect to the exchange rate is

$$\text{(IV)} \qquad \frac{d(\pi_F m_3 X_f)}{d\rho} \frac{\rho}{\pi_F m_3 X_f} = \frac{X_F}{X_f} m_2 m_6 + m_4 m_5$$

To find the net effect, deduct the latter from the former

$$\text{(III)} - \text{(IV)} = m_5\left(\frac{{}^*x_{Fh}}{{}^*X_F} + \frac{{}^*x_{FH}}{{}^*X_F} - 1\right) + m_6\left[1 - \left(\frac{{}^*x_{fh}}{{}^*X_f} + \frac{{}^*x_{fH}}{{}^*X_f}\right)\right] - 1$$

If autonomous investment at home and abroad are both positive, it follows from equations (37) and (38) that the coefficient to m_5 above is negative, the coefficient to m_6 is positive. Now a large income effect relative to the substitution effect in the domestic market makes m_5 negative, and in the foreign market makes m_6 positive. Were it not for the last term, -1, we could therefore be sure that (III) $-$ (IV) would be positive. For relatively very large income effects at home and abroad this will happen. Economically this means that devaluation of the domestic monetary unit, *i.e.*, raising ρ, will have a positive effect upon the balance of trade. Vice versa, if in both markets the income effect is small relative to the substitution effect, m_5 could be positive, and m_6 could be negative. Thus all three terms of (III) $-$ (IV) could be negative, and devaluation would have a negative effect upon the balance of trade.

18. *Factor Prices and Factor Productivities*

Although in a free society factor prices and factor productivities are not directly manipulated by public policy, it might be important to know the effect upon the balance of trade of factor-price changes, of technological advance or featherbedding practices.

The elasticity of the value of domestic export with respect to the price of domestic factors is the same as the elasticity with respect to the per-unit-of-output domestic factor requirement, *i.e.*,

$$\text{(V)} \quad \frac{d\left[\frac{\pi_f m_2 X_F}{\rho}\right]}{d\pi_h}\frac{\pi_h}{\frac{\pi_f m_2 X_F}{\rho}} = \frac{d\left[\frac{\pi_f m_2 X_F}{\rho}\right]}{da_{hf}}\frac{a_{hf}}{\frac{\pi_f m_2 X_F}{\rho}} = \frac{X_f}{X_F}\frac{m_3}{m_1 m_4 - m_2 m_3}$$

The elasticity of the value of domestic import with respect to the price of domestic factors is also the same as the elasticity with respect to the per-unit-of-output domestic factor requirement, *i.e.*,

$$\text{(VI)} \quad \frac{d(\pi_F m_3 X_f)}{d\pi_h}\frac{\pi_h}{\pi_F m_3 X_f} = \frac{d(\pi_F m_3 X_f)}{da_{hf}}\frac{a_{hf}}{\pi_F m_3 X_f} = \frac{m_4}{m_1 m_4 - m_2 m_3}$$

The net effect is

$$\text{(V)} - \text{(VI)} = \frac{1}{m_1 m_4 - m_2 m_3}\left(\frac{{}^*x_{Fh}}{{}^*X_F} + \frac{{}^*x_{FH}}{{}^*X_F} - 1\right)$$

Here is our only case in which the net effect does not depend upon the relative strength of income and substitution effects in the two countries. (V) $-$ (VI) as determined above is a product consisting of two factors, the first of which is always positive, the last of which is always negative. Thus (V) $-$ (VI) is always negative. This means that if the price of domestic factors is raised, the effect upon the balance of trade is negative. The same is true if the domestic factor productivity is lowered, *i.e.*, if the per-unit-of-

output domestic factor requirement is raised, *e.g.*, by featherbedding practices.

Such unequivocal results should not tempt the reader to jump to the conclusion that we have settled the widely-discussed issue of productivity disparity and the dollar gap.[1] What we have studied is the effect of a *ceteris paribus* change in productivity. Among the *ceteræ* to remain *pares* are the prices of goods. Thus improved productivity does not, in our model, automatically pass itself on to the consumer, and thus does not affect the competitiveness of national output. To the extent it does so, the combined effects will have to be studied in terms of not only (V) — (VI) but also (VII) — (VIII), to be developed in the following section.

19. *Goods Price Policy*

Again, in a free society public policy does not directly manipulate the prices of goods, but the effect of reduced domestic prices of goods upon the balance of trade is important and can be shown to bear a very simple relationship to the effects already discussed. The elasticity of the value of domestic export with respect to the price of domestic goods is

$$\text{(VII)}\quad \frac{d\left[\frac{\pi_f m_2 X_F}{\rho}\right]}{d\pi_f}\frac{\pi_f}{\frac{\pi_f m_2 X_F}{\rho}} = -\frac{X_f}{X_F}m_3\left(m_5+\frac{1}{m_1m_4-m_2m_3}\right)-m_1m_6+1$$

The elasticity of the value of domestic import with respect to the price of domestic goods is

$$\text{(VIII)}\quad \frac{d(\pi_F m_3 X_f)}{d\pi_f}\frac{\pi_f}{\pi_F m_3 X_f} = -\frac{X_F}{X_f}m_2m_6 - m_4\left(m_5+\frac{1}{m_1m_4-m_2m_3}\right)$$

The net effect is

$$\text{(VII)} - \text{(VIII)} =$$

$$-\left(m_5+\frac{1}{m_1m_4-m_2m_3}\right)\left(\frac{{}^*x_{Fh}}{{}^*X_F}+\frac{{}^*x_{FH}}{{}^*X_F}-1\right)-m_6\left[1-\left(\frac{{}^*x_{fh}}{{}^*X_f}+\frac{{}^*x_{fH}}{{}^*X_f}\right)\right]+1$$

When comparing the net effects of goods prices, factor prices, and devaluation we discover that

$$-[\text{(VII)} - \text{(VIII)}] = \text{(V)} - \text{(VI)} + \text{(III)} - \text{(IV)}$$

In other words, the net effect of a *reduction* of the domestic prices of goods is equal to the net effect of an increase of the domestic prices of factors *plus* the net effect of devaluation of the domestic currency. Since (V) — (VI) is known to be always negative we conclude that a reduction of the domestic

[1] Gottfried Haberler, "Dollar Shortage?" in *Foreign Economic Policy for the United States*, edited by Seymour E. Harris (Cambridge, Mass.: Harvard University, Harvard University Press, 1948), pp. 438–9; J. R. Hicks, "An Inaugural Lecture," *Oxford Economic Papers*, Vol. 5 (June 1953), pp. 117–35; F. Machlup, "Dollar Shortage and Disparities in the Growth of Productivity," *Scottish Journal of Political Economy*, Vol. 1, No. 3 (October 1954), pp. 250–67; and, more recently, E. M. Bernstein, "American Productivity and the Dollar Payments Problem," *The Review of Economics and Statistics*, Vol. XXXVII, No. 2 (May 1955), pp. 101–9; and Svend Laursen, "Productivity, Wages, and the Balance of Payments," *ibid.*, pp. 180–8.

prices of goods is less likely to improve the balance of trade than is a devaluation of the domestic currency.

20. *Reality versus Model*

When confronting our model with economic reality we shall, first, have to justify our assumption that the money-income elasticities of import as well as consumption of domestically-produced goods are equal to unity. For the leading industrial countries, Neisser–Modigliani [1] have measured the percentage change in the country's import volume associated with a 1% change in that country's money income (both in 1928 prices), assuming incomes of other countries to remain constant. In our notation, what is measured is $e_{Fh} + E_{Fh}$ and $e_{fH} + E_{fH}$. For the United Kingdom and the United States, the money-income elasticity of import was very close to unity indeed, but Germany had a considerably higher money-income elasticity, *i.e.*, 1·48 and 1·73 in 1928 and 1932. For smaller industrial countries, the money income elasticities seem to be of the German order of magnitude. For Swedish inter-war import, Faxén [2] has found the money-income elasticity to be 1·66, and for Norwegian 1935–39 import, Myrvoll [3] found the money-income elasticities to range from 1·48 to 1·66. No mention has been made of the money-income elasticity of consumption of domestically-produced goods, as distinct from the money-income elasticity of imports. No empirical contributions in this field are known by the present writer.

We have found the signs of our constants m_5 and m_6 to be crucial for public policy. The second question of an empirical nature to be dealt with, therefore, is that of the values of the elasticities E_{fh}, E_{Fh}, e_{fH} and e_{FH}. Of these, E_{fh} and e_{FH} have never, to the best knowledge of the present writer, been studied empirically. A small dent in our ignorance can be made as follows. Some empirical evidence would suggest that the money value of *all* domestic consumption, $\pi_f{}^*x_{fh} + \pi_F\rho t^*x_{Fh}$, is a constant proportion, call it K, of money personal domestic income $\pi_h{}^*\sigma_{hf}$. If constancy would hold in spite of changes in t, ρ, π_h or π_f, we could set the derivative of K with respect to any of these parameters equal to zero and thereby prove that e_{Fh} and E_{fh} must have the same sign.[4] As we saw in Section 4, however, both may be positive or negative, so the dent is, indeed, a small one. The remaining two elasticities, E_{Fh} and e_{fH}, have not been studied directly, but certain observations have been made of related elasticities. As we saw in Section 3 above, if the domestic demand elasticity of import with respect to domestic real income in terms of foreign goods is E_{Fh}, then the simple price elasticity of domestic demand for import is $-E_{Fh}$; likewise, the price elasticity of foreign demand for imports is $-e_{fH}$. These two magnitudes have been

[1] Hans Neisser and Franco Modigliani, *National Incomes and International Trade* (University of Illinois Press, Urbana, 1953).

[2] Karl-Olof Faxén, "Regressionsanalyser av den svenska importen under mellankrigstiden," *Meddelanden från konjunkturinstitutet*, Series B, 10 (Stockholm, 1949), p. 56.

[3] Ole Myrvoll, "Aktivitetsnivå og betalingsbalanse," *Festskrift til I. Wedervang* (Oslo, 1951), p. 34.

[4] This was suggested to me by Mr. J. Black.

studied quite intensively. For example, Neisser–Modigliani made a large number of price elasticity measurements; in the reliable cases, the price elasticities were found to be between −1·0 and −1·67.

In the second place, a number of so-called elasticities of substitution have been measured empirically. Using our own notation, we can express the elasticity of substitution concept usually measured as

$$\eta = \frac{d(x_{Fh}/x_{fH})}{d(\pi_F/\pi_f)} \frac{\pi_F/\pi_f}{x_{Fh}/x_{fH}}$$

or relative change in the ratio of foreign to domestic exports over relative change in the ratio of foreign to domestic prices. Using the time-series approach and using " foreign " for the country examined and " domestic " for the rest of the world, Polak [1] found elasticities ranging from −0·16 for Switzerland to −1·56 for Canada. But using the commodity-comparison approach, using " foreign " for the United States and " domestic " for the United Kingdom, and confining himself to American and British exports of manufactures to *all* countries, MacDougall [2] found the elasticity of substitution to be around −3. Now if the price of domestic goods, π_f, is constant, the elasticity of substitution concept defined above can easily be shown to be equal to

$$\eta = (-E_{Fh}) - (-E_{fH})$$

or the price elasticity of foreign exports *minus* the cross elasticity of domestic exports with respect to the price of foreign-produced goods. As we know, E_{Fh} is always positive, so the whole first term is negative. Now if E_{fH} were positive, to be consistent with MacDougall's findings it would have to be numerically small compared to E_{Fh}. But if it were negative its numerical value would have much more leeway. On pp. 488–9 of his article, MacDougall makes a good case for his approach as compared with the time-series approach.[3] The overall conclusion we can draw from his findings is that E_{fH} is either positive but numerically small or negative, indicating an income effect in the foreign market of moderate or small size versus a marked substitution effect. If this can be generalised, e_{FH} and E_{fh}, too, will be either positive but numerically small or negative. Thus nothing in MacDougall's findings precludes the possibility of e_{FH} and E_{fh} becoming negative and numerically large enough to make m_6 negative and m_5 positive, respectively.

21. *Conclusion*

The present paper has attempted to show that a large substitution effect and a small income effect, manifesting themselves in e_{FH} and E_{fh} being

[1] J. J. Polak, *An International Economic System* (University of Chicago Press, 1953).

[2] G. D. A. MacDougall, " British and American Exports: A Study Suggested by the Theory of Comparative Costs," Parts I–II, Economic Journal, Vol. LXI, No. 244 (December 1951), pp. 697–724, and Vol. LXII, No. 247 (September 1952), pp. 487–521.

[3] As pointed out by Irving Morrissett, " Some Recent Uses of Elasticity of Substitution—A Survey," *Econometrica*, Vol. 21, No. 1 (January 1953), pp. 41–62, the concept has been used by Tinbergen, Polak, Chang, myself and others without adequate recognition of Allen's original assumptions. Morrissett concludes that the concept correctly used is of little value for purposes of empirical study.

numerically large but negative, may defeat the purpose of devaluation, productivity increase, price reduction, etc., because domestic activity is stimulated too much. The possibility of such defeat has been shown to be fully compatible with recent findings of the high-elasticity school represented by MacDougall and Harberger.[1] *Thus elasticity optimism does not imply devaluation optimism!* Before the latter can be justified much more must be known about our crucial " cross " elasticities E_{fh} and e_{FH}.

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APPENDIX

List of Parameters

a_h^f = physical number of domestic factors purchased by domestic firms per unit of domestic output.

a_{HF} = physical number of foreign factors purchased by foreign firms per unit of foreign output.

a_{fh} = the domestic propensity to consume domestically-produced goods out of expected money personal domestic income when $\pi = \pi_F \rho t = 1$.

a_{Fh} = the domestic propensity to import foreign-produced goods out of expected money personal domestic income when $\pi_f = \pi_F \rho t = 1$.

a_{FH} = the foreign propensity to consume foreign-produced goods out of expected money personal foreign income when $\pi_F = \pi_f T/\rho = 1$.

a_{fH} = the foreign propensity to import domestically-produced goods out of expected money personal foreign income when $\pi_F = \pi_f T/\rho = 1$.

e_{ij} = the elasticity of demand for goods produced by sector i, demanded by sector j with respect to expected, real, personal income of sector j in terms of domestic goods.

E_{ij} = the elasticity of demand for goods produced by sector i, demanded by sector j with respect to expected, real, personal income of sector j in terms of foreign goods.

π_f = the price of domestic goods, charged by domestic firms.

π_h = the price of domestic factors, charged by domestic households.

π_F = the price of foreign goods, charged by foreign firms.

π_H = the price of foreign factors, charged by foreign households.

ρ = the exchange rate, in number of domestic monetary units per foreign monetary unit.

t = the domestic tariff ratio, *i.e.*, the ratio by which the price of foreign goods is raised when they enter the domestic country.

T = the foreign tariff ratio, *i.e.*, the ratio by which the price of domestic goods is raised when they enter the foreign country.

$^*x_{ff}$ = domestic expected gross private investment defined as that part of domestic output that domestic firms do not expect to sell to domestic or foreign households or governments.

$^*x_{FF}$ = foreign expected gross private investment defined as that part of foreign output that foreign firms do not expect to sell to foreign or domestic households or governments.

$^*x_{fg}$ = planned purchases of domestic goods by domestic government.

$^*x_{FG}$ = planned purchases of foreign goods by foreign government.

[1] MacDougall, *op. cit.*, and Arnold C. Harberger, " A Structural Approach to the Problem of Import Demand," *The American Economic Review, Papers and Proceedings* Vol. XLIII, No. 2 (May 1953), pp. 148–59.

THE INDUSTRIAL PATTERN AND NEW ZEALAND'S FUTURE

It has been suggested that, while the declared purpose of import restrictions and exchange controls is to safeguard the balance of payments, the use of such measures is now regarded as a normal instrument for the protection of domestic industries against competition from abroad.[1] On the other hand, even while some O.E.E.C. countries are a long way off the agreed target of 90% of imports free from quota restrictions, there is more talk in high quarters of the possible organisation of a single market within the countries of Western Europe. That would be a sensational landmark on the road to world free trade. Those who work for it would probably find "free trade within the Commonwealth" an even more difficult section to construct.

In New Zealand exchange control and quantitative restrictions were adopted at the end of 1938, well before the War forced their general use. This article will discuss some features of New Zealand's industrial pattern that are related to the use of tariff protection and import licensing.

A system of "moderate" protection was adopted for manufactures in 1895. By 1930 not much change had been made except that the ordinary tariff rates had become those of the British Preferential Tariff, with slightly higher duties on some imports from other Dominions, and rates on foreign goods about double those on British. In 1934 after a Tariff Commission had presented its report the government of the day went so far as to reduce the rates of duty on some manufactured products. It seems strange to read in the Report of the Commission that: "An industry requiring continued protection is asking an economic favour from the State."[2] To-day manufacturers seem to regard it as a natural right. They have been encouraged to think so in New Zealand since 1938. Towards the end of that year deterioration in the balance of payments reached a stage of crisis. A very comprehensive system of exchange and import control fitted in well with the political and general economic policy of the Labour Government which had been three years in office. Since then, relatively mature, nascent and new manufacturing industries have received the stimulus of both tariff and licensing protection against imports. The National Government which assumed office in 1949 proceeded quickly to relax exchange restrictions. They had to be imposed again in 1952 when the balance of payments turned sharply against New Zealand. Again it was announced in 1954 that controls would be relaxed in 1955, and importers and business-men in general were exhorted to do better than before. That year saw further deterioration in overseas reserves, the re-imposition of controls and the

[1] See M. L. Hoffman, "The Present System of World Trade," *Lloyds Bank Review*, January 1956, p. 5.

[2] Appendix to the *Journals of the House of Representatives*, H.28, 1934–35.

credit squeeze. In at least one case the return to import control had a definitely protective intention, as will be discussed below in the examination of the position of the wool manufacture. Two years before, the Board of Trade, which had been established in 1950, expressed an attitude towards trade policy much more in keeping with the older, traditional view than with that of the years since 1938. It re-affirmed its general policy of "moving eventually from import licensing to import duties when that can be done as a means of protecting sound local industries on a relatively stable basis."[1] By that time the new body had examined the position of a considerable number of industries, and some of its observations are here summarised.

Many New Zealand industries which had carried on for the last two or three years aided only by Customs duties fixed in 1934 or earlier "are carrying on successfully and are expanding their production without the protection of import licensing."

"There appear to be advantages to manufacturers and consumers alike in a reasonable degree of competition from imports." Efficiency might be improved. "In some cases, exemption from import licensing has not resulted in any material quantity of imports." Some fears of manufacturers have not been realised. High rates of duty sought "have not proved to be necessary." Many efficient New Zealand manufacturers are unaware, because they have not had to face competition for many years, how relatively strong they are in the New Zealand market. Some industries did not exist before 1939, they have never known any other form of protection but import licensing, "there is an understandable hesitancy on their part about a change in the form of protection." These observations of the Board of Trade show a calm appraisal of the position and a wish to do justice to the accepted general policy of the country, to the ideal of productive efficiency and to the interests of consumers.

The industrial pattern induced by growth and influenced by protective measures in New Zealand will become especially important in the coming years of this century. A clearer appreciation may be made possible by a brief reference to population trends. Including 129,000 Maoris, there are now just over 2 million people in the country. Twenty-five years ago there were a million and a quarter. Estimates lead to the expectation of 3 million by 1975, and 4½ million ten years later. There should be, by this rate of expectation, well over 5 million by the end of the century.

The population is spread over an area a little greater than that of the United Kingdom. There are four main centres. Dunedin, with 95,000 people, and Christchurch, with 174,000, in the South Island, and Wellington, the Capital, with 133,000 and Auckland, with 329,000, in the North Island. The picture is not complete without reference to the population of about 70,000 in the Lower Hutt, formerly a suburb of Wellington. There are nine other urban areas with more than 20,000 people. These aggregations of population are separated by approximately 400 miles of straight-line distance

[1] Appendix to the *Journals of the House of Representatives*. Report of the Board of Trade, H.46, 1954, p. 15.

in the South Island and 300 miles in the North between Wellington and Auckland. A small population, separated by large distances, makes a number of relatively isolated local markets for some commodities, relieved by road and rail, coastal shipping and air-freight services.

The increasing population will naturally provide larger markets and a continuous increase in the labour force. It seems to be generally assumed that, as the population grows, the best use of economic resources will be to stimulate " secondary " industries in order to provide increased production and, perhaps above all, employment for the increasing labour force. This was the burden of remarks made last year by the Minister of Industries and Commerce when referring to the placement of the 350,000 additional workers who were to be expected by 1975.[1] He estimated that employment would probably have to be found for about 130,000 of them either in primary industry or in secondary industry and that, of these, 100,000 would go to manufacturing. This, according to an *Economic Bulletin* of the Canterbury Chamber of Commerce, in which articles are written by members of the staff of the department of Economics of Canterbury University College (Christchurch), shows far too easy an acceptance of the inevitability of manufacturing rather than farming development in the near future. The *Bulletin* presents calculations of Gross Productivity per " equivalent male " in Tertiary and Service Industries, and in Manufacturing and Farming. For 1953–54 the Net Output for the first group was £569, for Manufacturing £1,076 and for Farming £1,384.[2] The figure for Farming is all the more significant because values are calculated at world prices, while those for Manufacturing are higher by the extent to which protection raises them. A similar opinion is expressed in a statement issued by the New Zealand Meat and Wool Board's Economic Service entitled, " Local Protection: Is it Necessary and if so in What Form? " Figures for Added Value per person for 1928–29, for 1932–33 and for 1952–53 " show that on the basis of net output per man, expansion of manufacturing in the thirties was justified and that today it appears to be unjustified." [3] It is relevant to point out that, while there are no large areas still awaiting, and suitable for, agricultural and pastoral expansion, the development of irrigation and aerial top-dressing, the latter in almost sensational fashion in the last few years, have in many cases trebled the sheep- and cattle-carrying capacity of lands that have been just within the margin. The possibilities of closer settlement are not exhausted.

The remainder of the article offers a brief description of some features of the pattern of manufacturing industry and comments on the development of four industries which are naturally included within the scope of the " infant industry " argument for protection. There is little, if any, real evidence of the localisation of industry in New Zealand, in the sense of concentration of a

[1] Quoted in Bulletin No. 373, *Canterbury Chamber of Commerce Economic Bulletin*, January 1956.
[2] *Ibid.*
[3] *Study Notes for Farm Discussion Groups*, by B. P. Philpott, a brief but comprehensive treatment of theory and facts.

considerable proportion of manufacturing output in one area. The population centres usually have factory workers roughly in proportion to the number of residents. It is true that biscuit production is much more important in the South Island than the North and that if a " location quotient " were worked out for the wool manufacture it would show concentration in Otago. But of the four mills in this statistical region two are ten miles apart and the next one thirty miles away.[1]

The average factory in New Zealand is small, and there has been little increase in the number of workers per establishment during the last twenty-five years. Professor Jewkes has recently examined the trend in the size of the factory, in this century, mainly by reference to the United States and Great Britain. Subsequently Professor Sargant Florence emphasised that, besides numbers engaged, it was necessary to examine the trend in the ratio of administrative staff to wage-earners, and in the amount of horse-power used per wage-earner, the latter as an indication of the likely extent of capital equipment. Judged by these criteria, " average size of factory is in fact creeping up almost everywhere." [2] In the following table these details are set out for New Zealand for the industries included in the Factory Production statistics, and averages have been calculated for three years before the real impact of the depression, for three years ending in March 1940, and, in order to cover a reasonable time after the War, for the four years ending in March 1951.

TABLE I

Size of Factories in New Zealand

Period.	Persons employed per establishment.	Ratio " staff " to wage-earners.	Horse-power per wage-earner.
1928–30	15·6	22·1	2·9
1938–40	17·0	19·8	2·9
1947–51	17·8	18·7	4·3

Note. Figures for horse-power are for 1927–28, 1937–38 and 1951–52, they are not always available as power used for driving factory plant. All figures are taken or calculated from the Reports on Factory Production or the *Official Year Book* unless otherwise stated.

It is clear that there was no great tendency to increasing size, as the number returned as engaged in Factory Production increased from 83,000 in 1929–30, to 108,000 in 1939–40, and to 149,000 in 1950–51. The staff-to-wage-earner ratio declined. The only really significant change is approximately 50% increase in the power used per wage-earner. This has accompanied the greater development of hydro-electric power which makes possible

[1] A Woollen Mill in New Zealand is not one specialised in the woollen as opposed to the worsted branch of wool manufacture. The New Zealand mill, historically, has made a wide range of products, of which the chief have been woollen and worsted cloth, flannel, yarn, rugs and blankets, hosiery, etc.

[2] See ECONOMIC JOURNAL, June 1952, " The Size of the Factory," by J. Jewkes, and comment by Sargant Florence, September 1954.

the extensive use of the small electric motor to drive machines in light industries.

New Zealand manufacturers know about increasing returns and economies of scale. They have for a long time urged that, if they were given adequate protection in the domestic market, they could develop larger and more efficient plants. Things have not worked out quite like that since the added protection of import licensing has been given to them. Competition, in a small country of scattered population like New Zealand, does not readily become effective enough to force the process of growth into surviving firms. More trees spring up in the forest, none grow very large.

In Australia the market is much larger and opportunities are greater. The large enterprise is fairly common. But the story is not very different. The average size of factory was 19·7 persons for 1927–30, 21·3 for 1937–40 and 22·2 for 1948–51.[1]

A much more definite picture of the development which has taken place under import licensing and during the recovery period after the depression is possible if attention is focused on the growth of particular industries. In a more detailed study, made some twenty years ago, four industries were selected because they were the most important, in terms of numbers employed, of the manufacturing industries which it had been the intention of the protective policy to foster.[2] They were, Biscuit and Confectionery, Boot and Shoe, and Clothing Factories and Woollen Mills. Their position was examined by the Tariff Commission in 1934. For the most part the extent of protection which the Commission recommended, and which the Government adopted, was unchanged, but the tariff was actually reduced on some products competing with those of all these industries except the Woollen Mills. Since then the duties have been substantially unchanged. The four industries are of even greater relative importance, when taken together. In 1951 they employed over one-quarter of those engaged in factory production. Their progress, while the unbroken period of import licensing continued, offers some indication of the manufacturing trend. Table II shows the criteria of size for these industries for the same periods as before.

It is not altogether easy to make comparisons. Judging by numbers per establishment, the Boot and Shoe industry showed a tendency to increase, the others a marked decline in size. The Clothing industry would appear to have given more attention to management, and it also showed a greater proportionate increase in horse-power used per wage-earner. No Net Output (Added Value) figures per person are shown. They are perhaps of doubtful significance, especially when comparing industries in which the relative numbers of female workers employed differs considerably. To make comparison more reasonable the statistical device of the " male equivalent " is sometimes used by taking three females as equal to two males. When

[1] As Professor Jewkes states the size, in numbers, increased in Australia during the War and then declined. The same occurred in New Zealand.

[2] Thesis presented for the degree of Ph.D. (Econ). in the University of London, 1934, entitled, "Some Aspects of Protection and its Relation to Economic Development in New Zealand."

TABLE II

Indications of Changing Size in Four Industries

Item.	Average 1928–30.	Average 1938–40.	Average 1948–51.
A. *Number of Establishments.*			
Biscuits and Confectionery	63	53	79
Boot and Shoe	76	77	123
Clothing	227	374	741
Woollen	12	12	20
B. *Persons Engaged.*			
Biscuits and Confectionery	2,579	3,298	2,785
Boot and Shoe	2,313	3,299	5,144
Clothing	7,207	12,462	17,806
Woollen	2,535	2,711	2,708
C. *Persons per Establishment.*			
Biscuits and Confectionery	41	62	35
Boot and Shoe	30	43	41
Clothing	32	33	24
Woollen	211	226	132
D. *Ratio Staff-to-wage-earners.*			
Biscuit and Confectionery	14·7	11·5	14·2
Boot and Shoe	14·2	10·0	9·5
Clothing	8·1	7·9	10·8
Woollen	5·9	5·1	5·3
E. *Horse-power per Wage-earner.*			
Biscuit and Confectionery	1·6	1·9	3·1
Boot and Shoe	0·57	0·51	0·82
Clothing	0·16	0·19	0·38
Woollen	2·3	2·3	3·3

this is done the Biscuit and Confectionery industry shows a Net Output for the two years 1949–51 of £925, Woollen Milling £828, Boot and Shoe Factories £644 and Clothing £623.

But, for the present purpose, the most satisfactory test of progress that can be applied is the ability of these industries to compete with imports, both under the period of the moderate tariff alone before 1940, and under the additional stimulus provided by the licensing system. The great bulk of imports competing with these industries comes from the United Kingdom. As stated earlier, the General Tariff is about double the British Preferential, and the rate on some imports from Australia and Canada is about mid-way between. The British Preferential rates on main competing items—and they have been unchanged, except for minor alterations, since 1934—are:

Confectionery, 25% *ad valorem*;
Boots and Shoes, 25% or 3*s.* per pair;
Apparel, 20% or 25%;
Woollen Piece Goods, Yarn and Blankets, 20%.

In order to present a brief and for the purpose it seems a satisfactory picture, there have been selected, from the list of Principal Imports into New Zealand, as published in the *Official Year Book*, those items which refer to the four industries being studied.

The relative progress of the four industries in satisfying the domestic market can readily be inferred. Imports of Confectionery declined in value

TABLE III

The Value of Principal Imports into New Zealand: Averages for Three Periods

N.Z. £000

Item.	1928–30.	1938–40.	1949–51.
Hats, caps and millinery	232	328	507
Other apparel	2,181	1,367	1,533
Boots and shoes	1,015	560	498
Confectionery	232	119	*Not Listed.*
Woollen piece goods	717	887	4,541

Note. Slight differences in classification for Hats, Caps, etc., for 1928–30, and the inclusion of Grindery with Footwear in 1949–51 are unimportant.

during the first interval, a clear decline in quantity as judged by price indices, and disappeared altogether from the list of Principal Imports in the second. Of course it must be understood that import licensing could be used to exclude imports altogether, but it is quite safe to say that, relying on New Zealand production, the domestic market was by no means starved. Imports of Boots and Shoes declined progressively. A similar but not so marked a decline occurred in imports competing with the Clothing industry.[1] On the other hand, imports of Woollen Piece Goods showed not much change in the first interval, when prices were relatively stable, but they increased at such a rate in the second as to show (substantiated by the quantity figures) a very considerable increase in volume. Under the system of import control the first three industries had apparently prospered; the Woollen industry had lost ground. This suggests that special attention should be paid to the details of production and competing imports and to the problem of its structure and organisation.

TABLE IV

Woollen Mills: Quantity of Main Products: Value of All Products and of Main Imports Compared

Period.	Quantity cloth and flannel 000s of yards.	Yarn made, 000s lb.	Total value all products N.Z. £000s.	Value imports woollen piece goods and yarn N.Z. £000s.	Ratio value of imports to N.Z. production, %.
1928–30	2,337	459	1,177	839	71·3
1938–40	2,341	817	1,226	1,071	87·2
1948–51	2,702	1,579	3,008	5,827	193·7

The figures in the final column show that, increasingly, the additional New Zealand market provided by the growing population has been supplied by imports rather than by domestic industry. Imports of Woollen Piece Goods almost doubled in quantity between 1939 and 1951, while the mills increased their output by about 16%.

When the New Zealand mills were developing in the closing years of last century they made a reputation for the quality of their rugs and blankets.

[1] Clothing rationing ceased in New Zealand at the end of 1947.

Imports of blankets progressively declined after the turn of the century, until by 1929 they numbered fewer than 500 pairs and were almost negligible as an import cost. A complete reversal has come about since 1930. The New Zealand mills have increased their production from an average of 127,000 to 132,000 pairs; imports have risen from 457 pairs to 296,000 pairs. Almost the whole of the increased demand has been supplied by imports. The explanation suggested here is probably a simple one. New Zealand mills have not maintained and increased their blanket-producing plant because, in the existing situation, it paid better to produce other articles. It seems doubtful whether the best interests of the consumer and the reputation of mills have been well served by this process. There has been little change in the number of Woollen spinning-frames and mules in the last twenty-five years, but Worsted equipment has about doubled. Plain looms are not much more than a third of their former number, but box looms, including automatic, have increased considerably.

It may be contrary to expectation, but the " average " New Zealand Woollen Mill is not smaller than the " average " in the United Kingdom, it is larger. The average for mills employing over ten persons in the United Kingdom, according to the 1950 Census of Production, was 136 persons. The figure for New Zealand in 1953–54 was 176. In spite of this, the size advantage is all with the industry in Great Britain. Almost all the New Zealand mills would be classified in Yorkshire as small or medium. But the fundamental factor is the scale of operations. The specialised mill in the United Kingdom is larger in its scale of operations than anything that is possible in the present structure of the New Zealand industry. There are few internal economies possible for the latter. External economies, it seems safe to say, do not exist. There has been talk from time to time of developing a wool-top making industry. The complete absence of regional concentration in any effective sense makes this and other specialisation difficult.

In Australia there has developed a measure of specialisation and localisation not achieved in New Zealand, but, even with a market over four times as large, the story is very much the same. It is true that an export trade has been developed in piece goods and yarns, but imports of woollen manufactures continue to threaten the Australian producer. The same arguments for maintained and increased protection are presented.[1] United Kingdom mills have greater specialisation, longer runs, a smaller range of lines and patterns, and lower wages. The disadvantage of higher wage costs is put forward as a major argument in favour of protection in both Australia and New Zealand, but here we are concerned with the relative progress of different industries. That the Woollen industry in New Zealand has fared

[1] See " The Case for Tariff Protection of the Woollen and Worsted Industry of Australia," submitted to the Commonwealth Tariff Board, April 1955. Also, the *Australian and New Zealand Weekly* for May 1956 refers to the case to be presented by the United Kingdom exporters to the New Zealand Board of Trade. The case suggests that the quota control of imports " introduced last October . . . was not for balance of payment reasons but as a result of representations made by the New Zealand industry for more protection." It states that quotas are contrary to international agreements such as G.A.T.T.

so badly compared with the other three to which reference has been made is surely due to factors inherent in its character and structure and not to one factor common to them all.

In 1955 exchange control was lifted on many imports. By the end of the year it had been re-imposed on woollen piece goods at the request of the manufacturers. This had, according to one of them, "saved the industry from chaos and unemployment." [1] It appears to be an example of a too sudden removal of a level of protection that had existed for a considerable period, and, as has been shown, the competitive position of the industry was already difficult enough. Exporters in Great Britain, on the other hand, resented the re-imposition of import licensing, and the New Zealand Board of Trade is now considering the rival claims. In the existing condition of New Zealand's overseas exchange reserves the problem of import licensing versus the tariff as the appropriate protective instrument will not be an easy one to solve. Nor will that of the appropriate amount of protection to be granted, for, with any population that may be foreseen, the size of the market and technical factors connected with it make it quite unlikely that New Zealand mills, over a sufficient range of goods, will be able to compete successfully in price and quality with those of Great Britain.

This brief analysis has shown that, in the years before the War, the four industries were making fairly steady and satisfactory progress. Three of them have subsequently gained a much greater share, if not the major part, of the New Zealand market for their products. But in this period, and whenever in the past the tariff has been raised, there has been a marked increase in the number of establishments. A scarcity of labour and capital make it relatively easy for the very small firm to commence and relatively difficult for the large firm to expand. It is instructive that, in what appear to be among the most successful of all manufacturing industries, Biscuit and Confectionery factories, British firms have merged with a New Zealand enterprise, as the names of Cadbury, Fry, Hudson; and Mackintosh, Caley, Phœnix, bear witness.

The decision of the Government on the use of import control or the tariff as the major instrument of protective policy will presumably follow the report of the Board of Trade, which is now making the most thorough investigation since that of the Tariff Commission of 1934. It is proceeding in two stages, the first a discussion of principles, the second a detailed inquiry into appropriate tariff rates. On the wisdom of its findings the pattern of industry and, as the population moves towards its third million, the rate of economic development, will in great measure depend.

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[1] From annual report of Mosgiel Woollen Factory Company Ltd., in *Otago Daily Times*, Dunedin, November 22, 1955.

TRADE BALANCES AND STATUTORY MARKETING IN PRIMARY EXPORT ECONOMIES

SINCE the War, many primary producing countries have introduced governmental monopolistic marketing arrangements for export produce. The marketing organisations set up under these schemes have taken over functions in the export trade which were previously performed largely by expatriate firms. " Price stabilisation " is usually one avowed purpose of these statutory marketing schemes; reducing the share in the proceeds of " the foreigner " and " the middleman " (often the same person) is another.

As a result of the high prices for which produce has been sold abroad, compared with the prices for which it has been purchased internally, at any rate in some years, most of the schemes have realised large " profits " from their operations. In some countries, such as Burma and Thailand, the profits have been disbursed in financing government expenditures. In others, among which the British West African territories are outstanding, the profits have been put mainly to reserve and have accumulated as external assets.

There has been a great deal of discussion recently about the statutory marketing schemes—the Produce Marketing Boards—in West Africa. In the course of the discussion the operations of the Boards and their impact on the West African economies have been extensively examined. The effects with which we are particularly concerned are those on the foreign-trade sector. Mr. Bauer has pointed out that the Marketing Boards' " decisions in fixing the prices paid to producers are a major factor in determining the level of incomes . . . and through their influence on the flow of incomes these decisions largely affect the balance of payments of the colonies." [1] Less attention has been given to the forces operating on the balance of payments when the Boards did not exist. This paper deals with the two most important West African territories, the Gold Coast and Nigeria, and with Uganda, a territory in British East Africa, where the statutory marketing arrangements take the form of a Cotton Lint Marketing Board and a Coffee Control, each operating a Price Assistance Fund. Comparison will be made between the foreign-trade sectors of these three territories in the period before the War, under " free marketing," and in the post-war period of statutory marketing.

It is first necessary to assemble data to show the scale of marketing-board operations in relation to the size of the export sector in the three territories. This is done in Table I. It will be seen (Table I, item *m*) that a substantial part of total export earnings—20% in Nigeria, 29% in the Gold Coast and as much as 38% in Uganda—has been skimmed-off by the marketing

[1] *West African Trade*, p. 263.

organisations.[1] This need not have affected the external accounts of the territories. If the levies had been used to finance public expenditure the

TABLE I

The Economic Impact of Statutory Marketing

	Gold Coast 1948–54.	Nigeria 1949–53.	Uganda 1950–53.
(*a*) Aggregate Exports (£ million)	556·2	545·7	156·5
(*b*) Aggregate "Controlled" Exports (£ million)	384·4	400·1	138·0
(*c*) = (*b*) as a percentage of (*a*)	69	73	88
(*d*) Marketing Organisation Sales Proceeds (£ million)	377·9	371·4	128·1
(*e*) Marketing Organisation Buying Costs (£ million)	218·6	262·5	68·4
(*f*) Marketing Organisation "Levies" (£ million): Duty	83·7	39·0	23·7
(*g*) Ditto: Surplus	75·6	69·9	36·0
(*h*) Ditto: Total	159·3	108·9	59·7
(*i*) = (*e*) as a percentage of (*d*)	58	71	53
(*j*) = (*f*) as a percentage of (*d*)	22	10	19
(*k*) = (*g*) as a percentage of (*d*)	20	19	28
(*l*) = (*h*) as a percentage of (*d*)	42	29	47
(*m*) = (*h*) as a percentage of (*a*)	29	20	38
(*n*) Increase in Marketing Organisation Assets (£ million)	58·6	51·1	24·5
(*o*) = (*n*) as a percentage of (*g*)	78	73	68

Notes: *Items* (*a*) and (*b*) are for calendar years; other figures are for various "crop years":

Gold Coast—cocoa, 7 years ending September 30, 1954.
Nigeria—cocoa, 5 years ending September 30, 1953;
oil palm, 4 years 9 months ending December 31, 1953;
groundnuts, 4 years 7 months ending October 31, 1953;
cotton, 4 years 8 months ending November 30, 1953.
Uganda—cotton and coffee, 4 years ending October 31, 1953.

Differences between *items* (*d*) and (*b*) are accounted for by use of calendar year in the latter and crop year in the former, and in the Uganda figures by the fact that not all coffee (one of the "controlled" or marketing organisation exports) contributes to the Coffee Price Fund.

total import bill may have remained unaffected. But enough has been saved[2] to be able to declare that "the major factor in the large export surpluses of the . . . colonies in recent years" has been the constriction of producers' incomes by marketing organisations, "since the process of restricting incomes below the sales proceeds of exports has served to reduce overall money demand for goods and services generally, including imports."[3] Table II illustrates this effect of statutory marketing by listing for each territory "export surplus as a percentage of exports" in each year since the War.

[1] Both the net surpluses of the boards, after export duty has been paid, and the export duty received by the Government are counted as marketing organisation "levies" (to use Mr. Bauer's convenient term), for the export duties fall on the surpluses of the boards.

[2] Over the period covered by Table I, the Gold Coast Cocoa Marketing Board increased its holdings of external assets by an amount equal to 78% of the surpluses accumulated, and the Nigerian Boards by an amount equal to 73% of their combined surpluses. In Uganda the assets of the cotton and coffee funds rose by 68% of the accumulated surpluses. But substantial amounts have been transferred to an African Development Fund, and if the assets of this Fund are added to those of the Price Funds the ratio of assets-increase to total surpluses rises to 98%.

It is impossible in principle to say how much of the export duties have been saved, but the whole question of the impact of government finance on the trade balance is examined later.

[3] P. T. Bauer, *op. cit.*, p. 309. Mr. Bauer is referring to West Africa, but his statement applies as much to Uganda as to any West African territory.

In view of the large-scale operations of the statutory marketing organisations, it is most surprising when one turns to the pre-war years, before the schemes had been introduced, to find that export surpluses then were rela-

TABLE II

Export Surplus as a Percentage of Exports

	Gold Coast.	Nigeria.	Uganda.
1945	36	25	66
1946	37	20	49
1947	20	26	45
1948	44	33	40
1949	9	28	49
1950	38	31	50
1951	31	30	54
1952	23	12	51
1953	19	14	29
1954	38	24	42
1945–54	30	24	46

tively *larger* than they have been since the War. Table III shows the aggregate export surplus as a percentage of aggregate exports in the pre-war decade, 1930–39, and in the post-war decade, 1945–54. In each of the three territories the pre-war percentage is slightly bigger than that for the

TABLE III

Export Surplus as a Percentage of Exports

	Gold Coast.	Nigeria.	Uganda.
1930	16	16	13
1931	43	27	29
1932	34	25	40
1933	36	28	61
1934	45	40	56
1935	21	33	52
1936	31	29	54
1937	24	25	50
1938	33	11	46
1939	44	36	47
1930–39	32	27	48
1945–54	30	24	46

post-war years. The precise figures are not, of course, of great significance. That the pre-war percentages are actually larger than the post-war ones merely high-lights the situation. What is remarkable is that the export surpluses in the post-war years, when the operation of statutory marketing

has had a powerfully depressing effect on the demand for imports, are not very much larger relatively than any experienced before the War.[1]

It would appear that the statutory marketing organisations are not, as seems generally to have been assumed, simply an additional determinant of the external economic balance of these territories, but one new element in a drastically rearranged balance of economic forces, the outcome of which has been export surpluses of no greater (relative) magnitude than those produced before the War. This supposition invites inquiry into the changes undergone by the other forces in the economic balance.

The possibility immediately suggests itself that externally financed investment in the territories has been so much greater than before the War as to counter-balance the operations of the marketing organisations. Whereas statutory marketing has operated to reduce imports, capital inflow tends to increase them. Has externally financed investment been large enough to constitute a significant offsetting element?

No direct comparison of capital inflow into the three territories before and since the War is possible, for the statistics do not exist. But it is possible to go a good part of the way to answering our question. It is possible to extract statistics of capital import [2] on public account from published sources. This has been done for Uganda for the post-war years, and the results are set out in Table IV. A more comprehensive approach is possible for the Gold Coast and Nigeria, for there are official balance-of-payments estimates for several post-war years for both territories. The figure of capital inflow for each territory is obtained as the difference in any period between the balance of payments on current account and the rise in external assets. To this is added the total of grants or donations which is given in the current-account

[1] A word should be said about import and export valuations. Particularly before the War these were highly unreliable, but the phenomenon with which we are concerned is sufficiently large not to be a mere illusion produced by inadequacies in the data. It has been said that, in Nigeria, trading profits on agricultural exports were to some extent excluded from the valuations in the trade returns (P. Bower, *Balance of Payments of Nigeria in 1936*, pp. 14–15). Mineral exports, on the other hand, were overvalued by the inclusion of ocean freight and other costs (Bower, *op. cit.*, p. 15). On balance, exports were somewhat undervalued, and the magnitude of the exports surplus is therefore understated. In Uganda the method of valuation exaggerated the export surplus by including in the value of exports certain transport costs incurred within East Africa beyond the Uganda border, and by excluding the corresponding costs from the value of imports. An officially prepared paper states that "imports are recorded at a *slightly* lower and exports at a *slightly* higher value than if the goods had been valued at the Uganda border" (Allen and Ely, *International Trade Statistics*, Chapter 16; italics added). This refers to the post-war years, and it may be that transport costs bulked relatively larger before the War, but the factor can hardly account for more than a small part of the recorded export surplus. Two further points about valuation should be made. Imports are valued c.i.f., so that the costs of transport services are already accounted for, and they are not an explanation of any part of the recorded export surplus. The post-war export figures are the revised figures, including the value of marketing board surpluses, and not the originally published figures, which in some years excluded the surpluses and valued exports on an "f.o.b. cost" instead of an "f.o.b. selling price" basis (see Allen and Ely, *op. cit.*).

[2] For the present purpose "grants" to the territories, such as those made under the Colonial Development and Welfare Acts, are treated as capital funds, because from our present point of view their effect is the same, although in balance-of-payments accounting they are considered as current external receipts.

estimates. The resulting figure for " capital " inflow (and the corresponding figure of more limited coverage in the case of Uganda) is added to the recorded export surplus to obtain what may be called the " potential export surplus," in other words, the export surplus which would have occurred (*cet. par.*) if capital inflow had been zero. This adjusted export surplus as a percentage of exports is then compared with the pre-war " export surplus as a percentage of exports." These manipulations are carried out in Table IV.

TABLE IV

Effect of Capital Import on Trade Balances

	Gold Coast 1950–54.	Nigeria 1950–52.	Uganda 1945–54.
	£ million	£ million	
Trade Balance	+156·9	+72·7	
Invisible Balance:			
Donations	− 4·0	+ 7·3	+ 4·0
Other	− 73·1	−11·6	
Current Balance	+ 79·8	+68·4	
Change in External Assets	+112·2	+87·2	
Capital Inflow	+ 32·4	+18·8	+ 7·3
Donations	− 4·0	+ 7·3	+ 4·0
Capital + Donations	+ 28·4	+26·1	+11·3
	%	%	%
Export Surplus ÷ Exports	30·1	23·4	46·4
Export Surplus + Capital + Donations ÷ Exports	36·3	31·1	50·1
Export Surplus ÷ Exports 1930–39	31·7	26·5	47·5

Notes and Sources :

Gold Coast—Gold Coast *Economic Surveys*, 1952, 1953, 1954.
1954 partly estimated from half-year figures.
Donations partly estimated.
Nigeria—*The Economic Development of Nigeria*, I.B.R.D., p. 87 (Nigerian edition).
Uganda—*East African Economic Review*, July 1955, pp. 46–9.
Colonial Development and Welfare Acts. Report . . . Cmd. 9375, January 1955.
Commonwealth Survey.
U.K. Appropriation Accounts.
Partly estimated.

The effect of the adjustments is to increase the size of export surpluses as a percentage of exports by between 4 and 8% in the relevant years. As a result the adjusted post-war figures exceed the pre-war percentages. But the excess is small: only 2% for Uganda, 4% for the Gold Coast and 4% for Nigeria. If these figures are compared with those of levies as a percentage of exports—38% in Uganda, 29% in the Gold Coast and 20% in Nigeria—it is clear that the effect on the balance of trade of capital imports is small compared with that of the statutory marketing organisations. The failure of the marketing organisations to produce much larger export surpluses than before the War cannot be explained, therefore, by an offsetting rise in capital imports.[1]

[1] It should be noted that we have implicitly assumed that there was no capital import or grants before the War. Our conclusion would be true *a fortiori* if account had been taken of pre-war inflows.

The inquiry may be carried a little further with the help of some unofficial estimates of the balances of payments of Nigeria and the Gold Coast in certain pre-war years. The nature of the statistical raw material for this period makes it inevitable that the estimates can be correct only in broad outline, but the change between the pre- and post-war periods is so striking

TABLE V

Balance of External Payments: Expenditure as Percent of Export Receipts

	Gold Coast.		Nigeria.	
	1936–39.	1952–54.	1936.	1950–52.
Imports plus Net Services [1] . . .	74	77	79	80
Payment of Net Investment Income. .	23	6	20	3
Net Capital Export [2]	3	17	1	17

[1] Net Services = Invisibles, excluding Investment Income and Donations.
[2] Including currency changes, donations and errors.

Sources :

Gold Coast 1936–39—J. Mars, *The Balance of External Payments of the Gold Coast for the Fiscal Years 1936/37 to 1938/39* (unpublished). I am greatly indebted to Dr. Mars for permission to make use of his study.
Gold Coast 1952–54—*Gold Coast Economic Surveys* 1953 and 1954. (Figures include only first half of 1954.)
Nigeria 1936—P. A. Bower, *The Balance of Payments of Nigeria in 1936* (Oxford, 1949).
Nigeria 1950–52—International Bank for Reconstruction and Development, *The Economic Development of Nigeria.*

that it could not be affected by any conceivable inaccuracy in the data. Table V shows the use to which export earnings were put in certain pre-war and post-war years in the Gold Coast and Nigeria. The data are presented in broad categories, expressed as percentages, both to show the facts clearly and to emphasise that no particular weight is being placed on details of the estimates.

The reversal in importance of payments of investment income and of capital export is unmistakable. It is tempting, in the light of these figures to argue that the introduction of statutory marketing, by displacing expatriate firms from certain sectors of the economy, has led to a marked fall in the proportion of external earnings required to pay for the economic functions performed by the firms; that heavy export surpluses have been maintained, as a consequence of the price policies pursued by the marketing boards, which have been the vehicle for capital export and the accumulation of large external assets instead of for the service of expatriate capital and enterprise; and to conclude that the impact of statutory marketing, as compared with a system of " free marketing," has therefore been on expatriate firms more than on native producers.[1] But such a conclusion involves a *non sequitur*, for it is incorrect to associate the pre-war export surpluses solely with the payment for the services rendered by expatriate firms in the export trade

[1] The author is indebted to Mr. E. Hallett for rescuing him from this error. Mr. Hallett is not, of course, to be held in any way responsible for the paper as it now stands, nor for any errors which remain.

in agricultural produce. The balance of trade is also affected by the remittances of expatriate firms concerned with the merchandise import trade and the mining industry, and the introduction of statutory marketing can have had no effect on these. In addition, there is the force exerted on the trade balance by government finance, of which the service of the external public debt is only one element. To go any further, therefore, it is necessary to discover what changes have taken place in the relative importance of these other elements in the situation. Something, at any rate, can be said about two of them: mining exports and government finance. The relevant figures are assembled in Tables VI and VII.

In both the Gold Coast and Nigeria mineral exports before the War were large enough for the remittance of mining profits to be an important component of the trade balance. Mining exports are now of less importance, and a fall in the relative magnitude of expatriated mining profits has an effect on the trade balance opposite to that of the marketing boards. The figures in Table VI indicate the extent to which this decline in the importance

TABLE VI

	Gold Coast.		Nigeria.		Uganda.	
	1930–39.	1945–54.	1930–39.	1945–54.	1930–39.	1945–54.
Expressed as a percentage of total exports:						
Export Surplus . . .	32	30	27	24	48	46
Mineral Exports . . .	39	24	14	8	3	1
Balance of Trade-impact of Government Finance .	+ 7	− 8	+ 9	− 4	−1	−12
Marketing Organisation Levies [1]		+27		+21		+38
Impact on Trade Balance of change between the two periods in:						
(*a*) Mining remittances [2] .		− 8		− 3		− 1
(*b*) Impact of government finance		−15		−13		−11
		−23		−16		−12
(*c*) Marketing organisation levies		+27		+21		+38

Items marked + tend to increase the export surplus, and those marked − to reduce it.

[1] For Nigeria and the Gold Coast these figures are rather less accurate than the corresponding ones in Table I, which are for the shorter period for which detailed information in Marketing Board reports is available. The Uganda figure is taken from Table I, and probably exaggerates the impact of the marketing organisations on the balance of trade for the whole ten-year period.

[2] These figures are based on the arbitrary, but perhaps not wildly unrealistic, assumption that mining-company remittances amount to 50% of the value of mineral exports. Appropriate adjustments to the table may easily be made if some other assumption about mining remittances is thought to be more realistic.

of mining has counteracted the new force exerted on the trade balance by the marketing boards.

Table VII summarises the results of an attempt to assess the impact of

government finance on the balance of trade during the pre- and post-war decades. Before the War net external public debt charges were (except in Uganda) a significant contributor to the export surplus. As might be expected, these are relatively far less important in the post-war years. This

TABLE VII

The Impact of Government Finance

£ million

	Gold Coast.		Nigeria.		Uganda.	
	1930–39.	1945–54.	1930–39.	1945–54.	1930–39.	1945–54.
Balance of Revenue and Expenditure [1]	+2·6	+51·6	− 1·8	+48·6	−0·1	+ 6·1
Deduct Export Duty paid by Boards		84·0		64·4		35·0
Net Revenue Balance	+2·6	−32·4	− 1·8	−15·8	−0·1	−28·9
Net current external payments [2]	+6·1	+ 6·0	+16·7	+15·1	+1·1	+ 4·4
Expenditure from grants [3]	−0·2	−11·4	− 0·2	−19·5		− 3·0
Expenditure from loans [3]	−1·0	− 9·9	− 3·9	−10·3	−1·4	− 9·0
Impact of Public Finance	+7·5	−47·7	+10·8	−30·5	−0·4	−36·5
Impact of Government Finance as a percentage of exports	+7%	− 8%	+ 9%	− 4%	−1%	−12%

Items marked + tend to increase the export surplus, and those marked − to reduce it.

[1] Including expenditure from Development Funds financed by appropriations from revenue, expenditure in Uganda by Electricity Board financed by advances from Uganda Government and the balance of the Regional Governments in Nigeria.

[2] External public-debt charges net of income received from assets held abroad and profits of Currency Board, and part of expenditure on pensions of government servants.

[3] External and local, including contribution from marketing boards, which are important in both grants and loans for the Gold Coast.

change, in itself, is some offset to the operation of statutory marketing. But public finance cannot be left at that. Account must also be taken of other transactions, some of which (revenue surpluses, including payments into reserve funds and "development funds," net of expenditure financed from such funds) tend to increase the export surplus, and others (expenditures financed by grants and loans, both external and local) to reduce it. And, because export duties paid by the marketing organisations have been treated as part of their "levies," contributing to their impact on the balance of trade, it would involve double counting to include the duties in government revenue when assessing the impact of government finance. Export duty paid by the marketing boards is therefore deducted from the balance of government revenue in Table VII. The result is to transform the revenue surpluses into deficits and to show government finance since the War as a negative influence on the balance of trade.

The changes, which it has been possible to isolate (as set out in Table VI), in the forces operating on the trade balance are therefore the following. First, a decline in the positive influence of mining-company remittances to

not much more than half that of before the War.[1] Secondly, a change in the overall impact of government finance from a positive to a negative influence in the Gold Coast and Nigeria, and from a small to a substantial negative influence in Uganda. Finally, the introduction of a new positive influence from the price policies pursued by the marketing organisations. In the Gold Coast and Nigeria this new force is offset to the extent of more than three-quarters by the changes in mining-company remittances and government finance; in Uganda only about one-third of it is offset in this way.[2] In the first two territories, therefore, the unexplained residual is comparatively small,[3] and the fact that the export surpluses experienced since the War have been (relatively) no larger than those before the War is largely explained by the counteracting changes in the other two forces. In Uganda, however, where neither mining-company remittances nor public finance seem to account for any important part of the pre-war export surpluses, a large question mark remains.

It is nothing new in the territories with which we have been concerned for a substantial proportion of total export earnings to be sent abroad, but the mechanism generating the surpluses has changed. Before the War they were to a large extent accounted for (except in Uganda) by the remittances of mining companies and the service of the public debt. Since the War they have been the result of marketing-board price policy. At the same time government expenditures have become relatively much larger, and government finance now exerts a negative influence on the balance of trade. A further novel feature of the post-war period is that the export surpluses have been matched by the accumulation of external assets, on both marketing-board and other public account, which are available to finance the balance-of-payments deficits which seem likely to occur in the future.

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[1] See footnote to Table VI.

[2] But it should be remembered that the figure we have taken for the impact of the marketing organisations in Uganda is probably an exaggerated one when applied to the whole post-war decade. See footnote to Table VI.

[3] To the extent that the assumption that mining-company remittances amount to 50% of mining exports exaggerates their importance, the unexplained residual is the larger.

ESTIMATING THE SOVIET NATIONAL INCOME[1]

IT is almost a century since the first estimate of the Russian national income was published in the *Journal of the Royal Statistical Society* of 1860, and fifty years since the appearance of the first estimates by a Russian economist. The Central Statistical Administration of the Soviet Union has prepared national accounts each year since the First World War; in addition, there are now nearly a score of estimates presented by scholars working in Britain or America, culminating in the recent appearance of Professor Bergson's comparative accounts for five selected years between 1928 and 1948.[2] It is thus an appropriate time to try to review the progress made in estimating the national income of the world's second industrial power and to compare the magnitudes, composition and methodologies of the computations.

The emergence of a considerable body of foreign academic work paralleling the data prepared by the national statistical office is unprecedented with respect to any other country and, although testimony to the natural interest the rest of the world shows in the Soviet economy, requires further explanation. Reference is made in the first section of the present study to certain statistical procedures of the official series which seriously affect intertemporal and interspatial comparisons, while the second and third sections consider the extent to which the foreign calculations seek to adjust Soviet data to different methodological and conceptual bases. As a measure of long-term change, the official Soviet figures suffer from the employment for nearly a quarter of a century of a constant-price structure at variance with actual factor rewards (and in the even longer term from improvements in accuracy); as a measure of short-term change and of sector contributions, they continue to be influenced by a price valuation reflecting a highly discriminatory tax scale. The shorter answer, however, is that the Soviet official data are almost wholly unpublished. The last full account was published in 1929, and the last summary breakdown (by six main sectors) available is for 1937. In the twenty years since, the only data published have been totals[3]—

[1] The author is a member of the Secretariat of the United Nations Economic Commission for Europe at Geneva. The views expressed herein, however, are his personal views and should not be interpreted as those of the Organisation.

[2] Abram Bergson, *Soviet National Income and Product in 1937* (New York: Columbia University, 1953); Abram Bergson and Hans Heymann, Jr., *Soviet National Income and Product 1940–48*, and Oleg Hoeffding, *Soviet National Income and Product in 1928* (Both New York: Columbia University, 1954).

[3] Until 1950 the money aggregates (in 1926/27 prices) were published. Subsequently, only index numbers (measured in 1951 prices) have been released. The position has not been altered by the publication during 1956 of three Soviet statistical handbooks. The index numbers of national income are reproduced but no breakdowns are quoted. The handbooks nevertheless are of some use as sources for composing national accounts: they provided data directly for four (and indirectly, in conjunction with other information, for sixteen) entries in a set of accounts for the year 1955 prepared by the present writer (not yet published) and containing some seventy independent entries.

at constant prices plus two isolated references (for 1940 and 1950) to the percentage breakdown (in current prices) between accumulation and consumption. The efforts of western scholars must primarily be viewed, therefore, as the provision of the statistical facts needed in a study of the Soviet economy rather than as an attempt to improve upon the work of Soviet statisticians, for it is clear that the official accounts must contain more accurate data than any outside estimate.

I

Sergei Prokopovicz published the first Russian estimate of the national income of his country exactly fifty years ago.[1] Inspired by Marxism,[2] he adopted that definition of the national income which excludes services not intimately associated with material production, a concept to which all estimates subsequently made in the Soviet Union adhered. Both statistical and territorial limitations inhibited Prokopovicz's computations, since the basic data, especially the agricultural, were collected by officials of a low level of literacy and covered only European Russia. He allowed for some shortcomings—*e.g.*, for deliberate crop under-estimation by peasants by adding a sampled margin of 10%—but, faced with other inadequacies, he adopted very rough guesses with spurious accuracy. For example, he used the product of employment and *per capita* output in factory industry to the last kopek for urban handicrafts [3] and passenger carriage, non-housing construction and the retailing of excise goods: in aggregate the sectors thus estimated contributed one-tenth of the total and one-fifth of the non-agricultural income. For his study of gross national product in 1913,[4] Prokopovicz was able to use somewhat better basic statistics, in particular the 1916 census of livestock and Kevdin's survey of Russian fisheries (1915), but handicrafts, urban passenger carriage and trade in excise goods were no better treated than for 1900. His total of 11·8 billion (*i.e.*, thousand million) roubles for European Russia (inflated, without detailed explanation, to 16·4 billions for the whole Empire) revalued in 1900 prices showed a 39% volume increase, within which industry had risen by 62%.[5]

[1] S. N. Prokopovicz, "Opyt ischislenia narodnago dokhoda v 1900 g." in *Trudy Imp. Volnago Ekonomicheskago Obshchestva*, 1906. Prokopovicz mentioned an earlier estimate of agricultural and industrial income by the Minister of Finance S. Yu. Vitte in 1897 (but this was so rough and inaccurate that it may be ignored) and another, published in St. Petersburg in 1896 and relating to 1894, by V. Pokrovsky incidental to a study on the Russian balance of trade (and whose income-per-head estimate was of the same order of magnitude as Prokopovicz's).

[2] He was deported from the Soviet Union in 1922, having formally broken with the orthodox Marxists in 1899, and is described by Soviet Marxists as a "bourgeois economist" (cf. A. Paltsev, *Natsionalny dokhod pri kapitalizme* (Moscow, 1954), p. 33). His estimates were accepted by Gosplan for 1900 and 1913 after deductions for depreciation and the reduced area of the country (cf. Gosplan, *Kontrolnye tsifry narodnogo khozyaistva S.S.S.R. na 1928–1929 god* (Moscow, 1929), p. 68).

[3] Nevertheless, he accepted for rural handicrafts an outside estimate of one-tenth this value.

[4] S. N. Prokopovicz, *Opyt ischislenia narodnago dokhoda 50 gub. evropeiskoi Rossii v 1900–1915 gg.* (Moscow, 1918).

[5] Prokopovicz also produced in the same study an approximate breakdown between incomes of the "working" and the "owning" classes.

The accuracy of Prokopovicz's estimate for 1913 [1] is of continuing significance to the extent that, only slightly adjusted by Gosplan, it is still frequently used by Soviet writers as the base year for national income index numbers. The official Soviet calculations have continued to use broadly the same coverage concept as Prokopovicz,[2] but this definition has not been without its critics in the Soviet Union. Thus N. Ya. Suzdaltsev [3] proposed to the Central Statistical Administration the inclusion of passenger transport; N. M. Krasnolobov [4] would also add private use of posts and telegraphs, and commercially-sold services; M. Bor [5] urged the inclusion of transport and communications used by individuals, and the exclusion of trading income not associated with a real appreciation of the worth of the traded goods (*e.g.*, retail profits and taxes, margin between cost of imports and receipts from exports); S. Turetsky [6] opposed the exclusion of education, public health and entertainment; while Kursky [7] strongly criticised on this score a text-book prepared by the Institute of Economics and argued for the inclusion of passenger transport, communal services, education, medicine and even Government administration.

Initially, official Soviet computations approached the national income from both the production and the expenditure aspects.[8] Computations on both methods were in fact made by Gosplan for only six years (1925–30), but they are of interest to the extent that their mutual relationship is precisely the opposite of that shown for the United Kingdom in not wholly dissimilar economic conditions: [9] the expenditure method showed a larger

[1] Two other estimates of the 1913 income (area and prices of that year) were 15 billion roubles (net of depreciation) by M. N. Sobolev, *Ekonomicheskoe Obrezenie*, No. 1, 1925, p. 48, who did not state his methods, and 17·6 billion roubles by A. Veinstein, *Sotsialisticheskoe Khozyaistvo*, No. 4, 1926, p. 8, who describes his figure as a revision of Prokopovicz's.

[2] "The national income of the U.S.S.R. is composed of the following branches of material production: industry, building, agriculture, transport (of freight), communications (serving the productive sector) and that part of trade which fulfils a productive function in circulation (packing, sorting, storage, movement)" (D. A. Allakhverdyan, *Natsionalny dokhod S.S.S.R.* (Moscow, 1952), p. 37). Other Soviet economists who defend this definition are V. Sobol, A. Petrov and A. Paltsev.

[3] *Vestnik Statistiki*, No. 1, 1954, p. 86.

[4] *Planirovanie i uchët narodnogo dokhoda* (Moscow and Leningrad, 1940), pp. 14–19.

[5] *Voprosy Ekonomiki*, No. 10, 1954, pp. 82–3.

[6] *Planovoe Khozyaistvo*, No. 1, 1940, p. 105.

[7] In a review of D. I. Chernomordik, *Narodny dokhod S.S.S.R.* (Moscow, 1939), in *Planovoe Khozyaistvo*, No. 10, 1939, pp. 92–3.

[8] "The study and computation of the national income make it impossible to give exclusive preference to one or other of these methods—we can approach the study of the size, structure and change of the U.S.S.R. national income only if we adopt and adapt both" (Gosplan, *Kontrolny tsifry, loc. cit.*).

[9] The comparison may be made with the United Kingdom from 1947 onwards, also both a post-war period and beginning with the re-attainment of the pre-war volume of national income. Although sector and factor proportions were widely different, the institutional structures ("productive relations" in Marxist usage) of the two countries were, at the time, both marked by predominant private enterprise co-existent with some recently-nationalised basic sectors. Roughly speaking, the price mechanism had a similar degree of operative significance at the beginning of each period, subsequently decreasing in the Soviet Union and increasing in the United Kingdom.

annual rate of increase in the Soviet Union when the growth of income was relatively large, whereas the converse was true of the United Kingdom.

During the twenties some national-income estimates using both approaches were published by private individuals,[1] but when subsequently the comprehensiveness of the State statistical services superseded the need for the collection of data by such independent workers,[2] the official estimates were confined to the production side. Krasnolobov mentions, only to reject, a further variant, summation by end-user: end-use aggregation, he explains,[3] would have no place for harvest losses or abandoned construction sites, and its price structure is very different from that used in national-product summation.[4]

Since the credit and tax reforms of 1930, the Soviet fiscal system has been such as to obscure its comparability with Western national-income estimates either at factor cost or at market prices. The official Soviet view is that in a socialist society factor cost and market-price valuations are identical, for the division of the margin between selling price and input costs in a State-owned establishment [5] (" turnover tax," " profit contribution to the budget," " retained profits," " Directors Fund," etc.) is guided by administrative convenience, not by explicit charges for capital or land. Some western commentators accept this contention,[6] others concede it in part,[7] while others regard it as outright catachresis.[8] An inversion of Hicks' postulate that a welfare appraisal requires market prices and a productivity appraisal factor cost [9] could, perhaps, be based on the predominance of the productivity motive. Although the Soviet Central Statistical Administration reports the national-income index under the head " Growth of the National Income and Improvement in the Material and Cultural Living Standards of the Nation," the definition used excludes a wide range of services obviously adding to welfare, and Soviet text-books always tend to stress the productivity implications.[10]

[1] L. N. Litoshenko, *Narodny dokhod* (Moscow, 1925), from the expenditure side; P. I. Popov (ed.) *Balans narodnogo khozyaistva Soyuza S.S.R. 1923/24 g.* (Moscow, 1926), from the production side. M. N. Sobolev, *op. cit.*, p. 53, and A. Veinstein, *op. cit.*, p. 9, produced production method index numbers, for 1923 and 1925/26 respectively, in constant prices on a 1913 base.

[2] Controversy on coverage or valuation procedure has nevertheless not resulted in the publication of estimates alternative to the official series.

[3] Krasnolobov, *op. cit.*, pp. 79–80.

[4] M. Bor, *op. cit.*, pp. 81–2, states that the production method is still the only method used, but argues for the computation of " utilised national income " (*i.e.*, excluding losses).

[5] If the majority of industrial co-operatives are eventually taken over by the State, as was suggested by the Chairman of the Council of Ministers (*Pravda*, July 17, 1955), State enterprises will control virtually the whole economy outside collective and private farming.

[6] Maurice Dobb, *Soviet Economic Development Since 1917* (London, 1948), p. 266.

[7] A. Bergson, *op. cit.*, p. 58.

[8] Alec Nove, *Soviet Studies*, January 1955, pp. 250–6.

[9] J. R. Hicks, " The Valuation of Social Income," *Economica*, May 1950, p. 124. For a proper measure of welfare Hicks was in fact prepared virtually to adopt the Soviet income definition and exclude public services (*ibid.*, p. 115).

[10] *E.g.*, T. Ryabushkin, *Ocherki po ekonomicheskoy statistike* (Moscow, 1950), Ch. 3.

Soviet practice is made the more acceptable to western statisticians by definitions offered by Nicholson and Kuznets. In a recent article the former reached the conclusion "that, except for any indirect taxes that may be imposed after the final stage of production, national expenditure at market prices is in fact equal to national expenditure at factor cost, if the latter is correctly defined." [1] Since Soviet indirect taxes are imposed during production, this identity may be established for the Soviet Union and the use of market prices vindicated for both welfare and productivity objectives of gross product estimation. Nicholson proceeds to the paradox that although total product should be valued at market prices, the relative contribution of each sector is correctly to be measured in factor rewards, *i.e.*, gross output exclusive of taxes *less* cost of inputs inclusive of taxes. The components of such a computation are, in fact, prepared by the Soviet Statistical Administration but are not so used. Each Soviet industrial enterprise (the procedure for other sectors differs radically only for agriculture) reports its output [2] in tax-free wholesale prices (monthly in constant prices and annually in current prices), as well as its expenditure subdivided by materials, fuel, energy, wages and amortisation. Summation of these enterprise outputs (including thereby outputs which are inputs of other enterprises) gives a tax-free gross output of industry used to measure the rate of growth of industrial output. [3] For the global value of industrial output, the Statistical Administration adds turnover taxes,[4] deducting duplicated inputs for the net contribution to national income. Although the concept used in the national accounts is thus value-added plus indirect tax, the Nicholson-type measure could be simply computed if the tax-free outputs were used instead of tax-inclusive outputs. The Statistical Administration has recognised that the levying of turnover tax almost exclusively upon consumer goods distorts the relative contribution of this sector [5] to global industrial output (without, however, admitting the same effect in the re-

[1] J. L. Nicholson, ECONOMIC JOURNAL, June 1955, p. 219. He points out that the "factor cost" of previous usage is better called "factor reward," since it will differ from the correctly defined "factor cost" if the price paid by the user incorporates a tax or subsidy.

[2] Net of intra-enterprise duplication. The turnover gross of intra-enterprise duplication was computed for industry as a whole until 1935, but the figure had, of course, no economic significance. Certain exceptions are made for vertically integrated enterprises, a list of which is given by A. I. Ezhov, *Promyshlennaya statistika* (Moscow, 1954), p. 80. Ezhov envisages a computation net of intra-industry duplication ("sometimes called the 'real' method"), but does not imply that it is used in current Soviet practice.

[3] In constant prices: until 1927 prices of 1911 or 1912, from 1927 to 1950 in 1926/27 prices, from 1950 to 1955 in prices of January 1, 1952, and for 1955 to 1960 in prices of July 1, 1955.

[4] The use of different aggregates for the rate of growth and for global value appears to date from the reform of industrial index methodology whereby 1952 prices replaced the obsolete 1926/27 prices. The first mention of the new usage seems to be by M. S. Urinson in A. I. Petrov (ed.), *Kurs ekonomicheskoi statistiki* (Moscow, 1954), p. 178; and was clearly spelt out by S. Genin, *Voprosy Ekonomiki*, No. 8, 1955, p. 71. This change helps to explain why, since the index reform, only rates of change and not global output values have been published.

[5] And between consumer-good industries by imposition at one stage only (*e.g.*, baking and confectionery enterprises pay no tax because the levy is made on flour-milling and sugar-refining).

lative contributions of industry and agriculture to national product), and each industry's outputs and inputs [1] are computed free of turnover tax. At least one Sovier writer, Bor (*op. cit.*), has gone farther and has called for national accounts in which the relative sector contributions are free not only of turnover taxes but also of profits taxes (which are assessed on a scale similarly discriminating against consumer goods). In order not to alter the aggregate from its presently-defined magnitude, Bor would then treat taxes as payments for government services. This is tantamount to adopting a much decried definition proposed some years ago by Kuznets.[2] Sector contributions are further altered by the Soviet calculation of farm consumption at the " average realised price " of cash sales, since these are depressed by procurement prices. This practice, moreover, overstates the rate of income growth, for, as labour moves from agriculture to industry, some farm produce is transferred from valuation at levels heavily weighted by low procurement prices to valuation in prices incorporating (or, on farm markets influenced by) high rates of turnover tax. As a solution another Soviet author, Braginsky,[3] has suggested the computation of farm consumption at retail prices.

Valuation procedure has been a further cause of divergence between accounted and real contributions to national income to the extent that constant price bases have been unsatisfactory. Current-priced sector contributions are deflated to base year prices [4] (a combination of 1912 and 1913 prices until 1929, 1926/27 prices from 1926 to 1951, 1951 prices from 1951 to 1955 and 1955 prices for 1956 to 1960). The inflation of the rate of growth induced by the use of the 1926/27 price lists [5] still vitiates comparison

[1] This is made clear by Genin, *op. cit.*, p. 73. A less-explicit reference to the practice by A. I. Gozulov, *Ekonomicheskaya statistika* (Moscow, 1953), p. 183, led Nove (*op. cit.*, p. 256) to believe taxes on incorporated materials were not deducted. Nove saw the absence of corrections for taxes on materials and for subsidies as the sole obstacles to considering these tax-free totals as factor-cost elements for the national income. This is not the case, as the totals are not " value-added " but gross of duplication.

[2] " Total factor costs would equal total payments to all factors net of all taxes, plus direct services rendered by government to individuals and additions to capital under government auspices. This sum of returns to all factors in the economy would at the same time equal the value of net output at market prices " (S. Kuznets, *Review of Economics and Statistics*, August 1948, p. 159). He regarded this, however, as only a rough, first approximation.

[3] B. Braginsky, *Vestnik Statistiki*, No. 2, 1955, p. 20.

[4] The procedure, which varies from sector to sector, is critically described by Paul Studenski (*Studies in Income and Wealth*, VIII, 1946, and, with Julius Wyler, *American Economic Review*, May 1947) and by Nove (*op. cit.*, pp. 267–73); until 1951 construction seems to have been included at current prices without adjustment.

[5] Soviet and other criticisms of the 1926/27 prices are too well known for repetition here (see, in particular, Donald Hodgman, *Soviet Industrial Production, 1928–51* (Cambridge, Mass., 1954), pp. 8–17). Alexander Gerschenkron has shown (*Review of Economics and Statistics*, May 1955, pp. 127–8) from both American and Soviet data that very much higher rates of growth are shown by index numbers of engineering output when based on price structures pertaining to earlier periods of industrialisation. Ira Scott (*ibid.*, November 1952, pp. 386–7) had pointed out that this form of index-number bias was not uniform to all industry, and Gerschenkron shows the bias to be phenomenal only for machinery. The bias—as will be indicated below—seems generally to affect national product estimates.

between the official series before and after 1950, for the only retrospective repricing undertaken was for the link year needed to splice the two indexes. The 1951 base prices are in themselves more reflective of real factor rewards than their predecessors but still germinate, so far as industry and transport are concerned, two seeds of distortion. The less important is the evolution of production since 1951 (introduction of new goods not produced, and consequently not priced, in 1951 and changes in the pattern of cost relationships).[1] The more important is the temporary abandonment of the full-cost principle in 1950. Industrial wholesale prices and freight rates were raised in 1949 to allow for the elimination of subsidies by 1950 and were deliberately sighted slightly below current average full costs (*i.e.*, they were based on the planned costs for 1950). In 1950, however, although costs had not fallen to the extent required, two sets of price cuts were made—in January and July—embracing even goods whose average cost already exceeded price (*e.g.*, timber).[2] The price lists introduced on July 1, 1955, are officially reported not only correct for the first group of divergencies but will apparently make a return to the full cost principle.[3]

II

The estimates of Soviet income prepared abroad fall into two groups: those which use a rouble valuation (predominantly studies of static structure) and those which are valued in foreign currencies (and attempt primarily interspatial comparisons).

The rouble valuations are dominated by the work of Bergson and his two collaborators.[4] Bergson's aim was to extricate as many components of the national accounts as possible from Soviet sources, to estimate the others and to adapt these values at current transaction prices [5] to a theoretically conceived "adjusted factor cost standard." Bergson envisaged this standard as, under certain assumptions, satisfying both a welfare criterion (for which commodity values are proportionate to marginal utilities,[6] discounted

[1] As Genin, *op. cit.*, p. 74, makes specific references to these points, their effect cannot be wholly insignificant.

[2] The pricing policy changes of 1949 and 1950 were observed respectively by the present writer (Economic Journal, March 1950, pp. 89–90) and by Nove (*op. cit.*, pp. 260–1).

[3] The scattered evidence for this view cannot be detailed in the present paper, but includes the price indexes (1955 over 1952) for certain products given in *Zasedanie Verkhovnogo Soveta S.S.S.R.* (Moscow, 1955), p. 242, and the evolution of costs as quoted in the annual plan reports and elsewhere.

[4] Of the three studies noted at the beginning of the present article, that for 1937 was originally published in the *Quarterly Journal of Economics*, May and August 1950. The revisions in the final monograph were mainly confined to a different treatment of subsidies.

[5] In 1928 most transactions responded to a freely functioning price mechanism, but for the later years studied this was probably true only of direct sales from farmer to consumer (now comprising about one-fifth of urban food supplies). Bergson has subsequently been elaborating price indexes to link these current-valued magnitudes: the first instalment of his study, written in collaboration with Roman Bernaut and Lynn Turgeon, on the prices of basic industrial products during 1928–50, was published in the *Journal of Political Economy*, August 1956.

[6] Interpreting this, if necessary, as the preference schedules of the planning authorities.

in the case of investment goods for time-preference) and an efficiency criterion (for which the price of any two commodities must vary inversely with the ratio of the marginal productivities of a given factor in each of them). On this standard, factor prices, on the one hand, reflect the resource allocation which would take place with a variation in the ratio between the marginal utilities of any commodities and, on the other hand, being uniform between users, correspond to relative factor productivities on the average in the economy. In application to the Soviet accounts Bergson concentrated upon the adjustments to Soviet market prices for meeting an efficiency criterion—viz., a net charge for capital (conventionally amortised), a rent corresponding to the differential returns on superior land, a wage to labour correlated with productivity and disutility, and non-discriminatory commodity pricing. Wiles [1] has demonstrated a defect in this procedure in that the Soviet wage structure significantly diverges from the pattern implied by existing scarcity relationships; in a comment on this criticism, Mrs. Robinson [2] has pointed out that there is no more rationality in the current capitalist solution of the attraction (expulsion) of labour by expanding (contracting) trades via wage inflation (depression), so that Bergson did not advance his case by equating Soviet with capitalist wage differentials. In fact, the Soviet wage and market-price systems are reasonably satisfactory measures of a Bergson welfare criterion; the other Bergson adjustments of factor remunerations reflect, however, an efficiency criterion.

This hybrid nature of the underlying criteria clouds the meaning of Bergson's final accounts, but the actual adaptations to Soviet-priced valuations other than those needed to reduce to conventional factor-cost (by eliminating the turnover tax,[3] and subsidies) are quantitatively small [4] and reduce to three. For the first adaptation, farm produce sold direct by the grower to the consumer is reduced to State prices free of tax, but the factor remuneration to the producer is maintained by raising agricultural procurement prices in the same amount.[5] Secondly, earnings in 1940, 1944 and 1948 in farm and military employment are raised to the parity with com-

[1] *Soviet Studies*, October 1955. He is less than just in claiming that neither established nor Bergson-adjusted prices allow anything for land and capital charges. The differential assessments of compulsory deliveries and planned profits may be inadequate payments for rent and interest, but they do form part of final price.

[2] *Ibid.*, January 1956.

[3] Only Hoeffding eliminated all indirect taxes. In the interests of accuracy (and Nove, *Review of Economics and Statistics*, May 1955, has criticised the spurious accuracy of some of their rougher computations carried to two decimals), the other studies could have done the same. Their exclusion in 1948 would reduce the share of civilian consumption in " adjusted " gross national product from 43·1 to 42·7%.

[4] George Jaszi (*American Economic Review*, March 1954) criticised Bergson for claiming to avoid the United States Department of Commerce's " national income at factor cost " when his accounts differ so little from this concept and when his computation, using the Department of Commerce concept, is in fact erroneous.

[5] This is the main adjustment made for multiple pricing. Bergson and Heymann (p. 62) have performed a signal service in proving from Soviet sources that purchases on military account are not—as is often suggested—made more cheaply than on civilian account.

parable work in other sectors believed to have existed in 1937; however, Hoeffding considered such a correction for 1928 as "altogether too speculative an undertaking" (p. 71). Finally, with some augmentation, recorded net profits and depreciation allowances[1] are used as the charge for capital and its amortisation.[2] When reporting that "regrettably Soviet sources have little to say on the principles according to which profits are fixed," Bergson does not refer to the presumption that a more efficient plant (which is usually more capital-intensive) is expected to earn more profits than its fellow producers or that profit margins in capital-intensive industries (*e.g.*, electricity generation) are set above the average for industry as a whole. This is far from implying a uniform ratio of profits to capital throughout the economy—which is not the case even after the reforms of 1949—but it is noteworthy that the sum of net profits amount to about 7% of the authors' estimate of fixed capital, and they take 8% as the appropriate standard.[3] The essence of the authors' adjustments is not, however, a correction to the average return on capital but to its distribution between sectors, since in the years studied some were absolved from profit (quasi-interest) charges, while others made disproportionately high payments.

The accounts are modelled on those prepared for the United States of America by the Department of Commerce, a choice justified by the interest of comparisons between the two major world powers. In one respect a case can be made out for slight divergence from the model, viz., in the treatment of counterpart funds derived from sale of Lease-Lend and reparations deliveries (significant in 1944[4] and 1948 respectively) as customs revenue, and thus as domestic product. Bergson followed the Department of Commerce in its more recent accounts by abandoning depletion allowances, but the justification of this as being also Soviet practice is not quite accurate.[5]

In the case of the first three the choice of years is irreproachable—1928 was the first year of the First Five-year Plan, 1937 the first year of the Third (with its "New Deal" for the consumer and its reformed price structure) and 1940 the last pre-war year. Bergson and Heymann have incidentally

[1] Bergson and Heymann have not, however, observed that about half Soviet depreciation charges are in fact a savings device for paying repair bills. In consequence, the true depreciation charges recorded—currently little more than 1% of the stock of productive capital (including that against which no depreciation is charged)—were even further below their "correct depreciation charge" of 3·5% than they imagined.

[2] Interest payments as such by Soviet enterprises are virtually ignored, but interest-bearing loans at present cover about one-tenth of net investment.

[3] The difference is not significant, as the capital estimate was obtained by applying to a value in "1945 prices" a capital-goods price index computed by Jasny (*Soviet Prices of Producers Goods* (Stanford, Calif., 1952)), which is not only perforce based on a narrow range of quotations but is of but partial relevance to the 1945 price lists (which were constructed by applying price, productivity and wage change-coefficients to the "1936 prices" used for investment valuation in the Third Five-year Plan).

[4] Lease-Lend supplies are shown to have represented 5% of the 1944 gross national product.

[5] Enterprises working natural resources other than the commoner minerals are required, by charging scarcity-reflective prices, to earn a super-profit for the State; for timber-cutting the charge is in the form of a direct fee, but it was small until 1949, when it was tripled.

very usefully codified the territorial coverage of the data (both contemporary and post-war published) concerning 1940 [1]—the areas incorporated between September 1939 and August 1940 having added one-eighth to the Soviet population. The 1944 study is of small interest and was included "as a war year of high military output" (p. 17) presumably because the United States Air Force was among the sponsors of the research. Not only are data scanty for the year (though there are more for 1944 than for other war years), but the computations lead in some instances to unreal results. Thus the earnings of collective farmers, assessed as better on average than those of (mainly urban) wage-earners in 1940, are put at 6% below wage earnings in 1944: under conditions of stringent rationing of urban consumers (at one period the ration card for the lowest category of consumer was valid only for grits and matches) it would seem to be obvious that, at least in terms of the maintenance of a normal consumption pattern, the peasant is at an advantage. Similarly, 1944 military earnings (inclusive of subsistence) are held to have been below average civilian wages by very much more than the pre-war differential at a time when rations for the Armed Forces were the highest in the scale. Nor is the final year selected, 1948, an ideal post-war year for the purposes of the study, principally because it was the year of maximum divergence from the criteria required by Bergson's own "adjusted factor cost standard." The reforms which came into effect on January 1, 1949 proscribed the subsidy system (a few remaining exceptionally), fixed wholesale prices to cover costs and what could be termed capital charges (prices included an average profit of 2–5%, the more efficient firms to earn more than the mean) and initiated a downward trend in costs which has continued to the present. This downward trend, together with an overhaul of amortisation norms in 1950, brought depreciation charges nearer to the theoretical ideal (*i.e.*, that, summed over the asset life, they should equal original cost).[2] Later reforms, from 1953 onwards, have done much to eliminate other factor-price disparities. Compulsory delivery quotas, supplementary State purchases and machine-tractor station fees have been transformed squarely into Ricardian rent, free of the previous tax on efficiency. Factor services in agriculture—undervalued in comparison with other sectors since the late twenties—were better remunerated by virtue of a series of laws and decrees, of which the first was promulgated in August 1953, and which have continued to the time of writing. Finally, work began in 1955 to bring labour remuneration more into line with efficiency and disutility criteria in industry,[3] construction and agriculture.

[1] Their evidence on the coverage of the agricultural data is slight, but better proof is to be found in the sown-area statistics for 1940 published in 1941, which may be shown to comprise the whole of the end-1940 territory, whereas those for the same year published after the war exclude the Bialystok region (incorporated in 1939 but retroceded to Poland in 1945).

[2] Bergson, p. 59, stresses the divergence from this ideal caused by inflation and overestimation of service life in the years studied.

[3] Official statements foreshadowing these reforms have shown that, contrary to the views expressed by Bergson and Heymann (p. 58) on post-war developments, the 1940 decree on labour

In as comprehensive a piece of research as these three studies, requiring the discovery [1] and interpretation of statistics covering the whole of the Soviet economy, it is inevitable that some small errors can be discovered, but they are very few indeed. Bergson seems misinformed in stating (p. 113) that as premia from the Directors Fund are already included in wage bills, there is some double-counting in the computed gross national product, for Gozulov [2] makes it clear that these premia are excluded. Bergson refers (p. 117) to an inconsistency in Soviet sources between figures of working capital and attributes it " very likely " to a difference in coverage. It is more probable that one set of figures excludes and the other set includes the so-called " excess working capital," which has to be transferred to the budget at the end of the year. Finally, he finds (p. 122) the scope of State expenditure on " forestry " unclear, since " lumbering generally is included under industry ": the outlays are on forest services (fire prevention, re-afforestation, seedling nurseries, etc.). Bergson and Heymann wrongly assume (p. 74) that Soviet statistics of fixed capital stock are net of depreciation, whereas the Statistical Administration, primarily concerned with assessing useful capacity, allows only for retirements. They could have gone further in suggesting (p. 132) that rents may not much exceed operating expenses and depreciation, as Soviet text-books on housing administration show that rents do not always cover depreciation. Moreover, they use the official scale relating rent to the tenant's wage to compute (p. 135) for 1944 and 1948 respectively rentals of 1.50 and 1.90 roubles per square metre, although the regulations set a maximum of 1.45 roubles. It may also be recorded, though the information making the computation possible was not published until after the studies had appeared, that the 1948 urban housing stock was some 310 million square metres of living area,[3] compared with their figure (p. 132) of 261 million. On the other hand, later information has shown the accuracy of their estimates of wages and retail turnover.[4] Subsequent official statements have also vindicated their assessment of the place of the budget surplus " as the counterpart of bank financed working capital and dishoarding by economic organizations and households " (p. 215), although they were misled (p. 214), presumably by the pre-war decline of long-term bank credit (41% of bank loans in 1933, 13% in 1940, 15% in 1950), into concentrating attention on short-term credits.

A methodology similar to Bergson's had earlier been developed by Jasny.

direction had become a dead letter, and that the correlation of wages and productivity had been impaired in order to maintain wage/disutility relationships.

[1] Something like an official statistical abstract was available only for 1928 and 1937, and in the case of the latter year was restricted in scope.

[2] *Op. cit.*, pp. 282–3.

[3] Nor were they to know that, beginning with 1948, global housing data began to be quoted in terms of useful area: they assumed that the previous practice of measurement in living area (*i.e.*, excluding kitchens, bathrooms, etc.) was still in force.

[4] Cf. the present writer in *Soviet Studies*, July 1955, pp. 43 and 45.

He has computed [1] national product totals in terms of his " real 1926/27 prices," [2] goods not in production in that year being aligned with comparable goods for which a 1926/27 quotation is available. As Hoeffding has shown that the established price structure of 1928 diverged relatively little from the " adjusted factor cost standard," [3] the Jasny and Bergson criteria are reasonably close to each other. The resulting estimates of national product, both by origin and by use, are, however, at wide variance—compare, for example, their 1937 estimates of the share of agriculture (Table II) and consumption (Table III)—the principal reason being Jasny's wholesale rejection of many Soviet statistics which Bergson accepts. Thus Jasny claims that retail turnover declined in each successive year studied (admitting it a " startling result " when urban population increased 2·8 times during the period) and that the rates of growth of industrial production and construction were half those shown by the official statistics between 1928 and 1948. Much—though not all—of his deflation of the Soviet data in " 1926/27 prices " originates in the price indexes he computed. He was the pioneer in the field—official Soviet price series not having been published for a quarter of a century—and it must be recognised that three studies which have followed his agree remarkably with his findings. His retail-price index, although based on a mere sixteen goods and four services, shows precisely the same rise between 1928 and 1948 as one (based on 94 and 149 items in each decade respectively) compiled by Mrs. Chapman,[4] and his investment-goods price index is little different from those recently published by Wiles [5] and Bergson.[6] On the other hand, the industrial production index at which he arrived—showing a 220% increase between 1928 and 1948—is considerably below any alternative estimate. Thus Hodgman,[7] weighting 137 products with 1934 industrial wage-bills, showed a 364% rise (and there seems good evidence for considering this an understatement) [8]; Seton [9] computed an

[1] Naum Jasny, *The Soviet Economy during the Plan Era* (Stanford, Calif., 1951), for estimates to 1948 and in *Social Research*, Spring 1954, for 1948 to 1950.

[2] In *Journal of Political Economy*, August 1947, Jasny considers the main defects of the official series other than those of the 1926/27 prices to be the inclusion of unusable goods (*e.g.*, harvest losses or spoilt output); inadequate amortisation; the unrecorded decline in home processing; poor coverage of small-scale industry in the earlier years; and such miscellaneous faults as the inadequate allowance for seed.

[3] Apart from the exclusion of indirect taxes and subsidies normal to factor cost, Hoeffding's only quantitative adjustment is for differential profit incidence, involving no more than a 1% reduction in household consumption.

[4] Janet Chapman, *Review of Economics and Statistics*, May 1954.

[5] Peter Wiles, *Encounter*, November 1955, p. 66.

[6] A. Bergson, R. Bernaut, L. Turgeon, *op. cit.*, use considerably more refined methods and a much wider range of quotations: they show a 1949 index for basic industrial products (excluding tax) of 534 (1928 = 100) compared with Jasny's 500–600 (1926/27 = 100).

[7] D. Hodgman, *op. cit.*, p. 89.

[8] Cf. reviews of Hodgman's methods by Francis Seton, *Soviet Studies*, October 1955, and Richard Moorsteen, *American Slavic and East European Review*, February and April 1956.

[9] F. Seton, *The Tempo of Soviet Industrial Expansion* (a paper read to the Manchester Statistical Society on January 9, 1957).

increase of 414–421% between those dates by applying regression equations relating the manufacturing indexes and energy and steel inputs of fourteen capitalist countries to Soviet energy and steel inputs; Clark [1] with, however, a mere twelve items to weight in his "international units," obtained a 1940 value of 3·4 times 1928 (1948 output is generally agreed to have regained the 1940 level); and Gerschenkron's dollar-priced index for heavy industry [2] summed with the Soviet series for light industry [3] showed a 3·5-fold increase on 1928 in as early as 1937. No such comparison can be made with his agricultural output estimates, in which his work stands alone, but the relationship he shows between farm and non-farm earnings seems better founded than those of Bergson and Hoeffding. In reproducing his figures (in Table III) no account is taken of his apparent error in deducting, as an alleged duplication, the labour remuneration component of public-service outlays.

Seton's study,[4] like Bergson's, is confined to structural analysis, in this instance for 1934: it is modelled on the form of national accounts developed by Stone and seeks maximum comparability with Bergson's accounts for 1937 in established prices. Although Seton is more detailed than Bergson, there seems only one difference in methodology, and that is minor; whereas the latter uses rentals for State-owned housing for the imputed rent of owner-occupied dwellings, Seton takes a Soviet estimate of depreciation on non-socialist property (*i.e.*, including private farm capital) and provides no depreciation in the operational account of individual producers. This means that some outlay and income properly in the business ledger is entered in the household ledger. A similar, but even less significant, partial mis-entry is the attribution of Savings Banks deposits wholly to households, whereas some are made by institutions otherwise entered under business. Moreover, in confronting their estimates with the Soviet statistics of product distribution by use, Seton differs from Bergson in interpreting the division between "consumption" and "accumulation": Seton includes defence in "consumption," while Bergson puts the munitions component in "accumulation" and pay and subsistence in "consumption." Both in fact seem wrong: [5] some share of munitions is included with pay and subsistence under "consumption," the remainder appears as "accumulation." Seton, while briefly discussing the effects of the established price structure, presents his accounts in current market prices, adopting the Soviet convention of valuing farm income in kind at the average price realised for cash sales, but rejecting their convention of applying procurement taxes to in-

[1] Colin Clark, *The Conditions of Economic Progress*, 1951 edition, p. 186.

[2] Alexander Gerschenkron, *Review of Economics and Statistics*, May 1955.

[3] Very much less influenced than heavy industry by the inflation of "1926/27 prices" as a result of the incorporation of new products.

[4] F. Seton, *Review of Economics and Statistics*, August 1954.

[5] Cf. D. A. Allakhverdyan, *Nekotorye voprosy teorii sovetskikh finansov* (Moscow, 1951), pp. 30 and 31, and M. Bor, *op. cit.*, p. 89.

dustrial value-added. The value of his accounts lies in the ingenious excavation of the figures which Soviet statisticians would have produced had they been asked to draw up a Stone-type matrix. Accounts for 1948 and 1953 drawn up by Nove [1] resemble those of Bergson rather than Seton but without any Bergson-type adjustment from current market prices. In quoting Nove's estimates, Wiles has applied sector-price indexes, calculated (except for consumption) by himself, to obtain growth rates in comparable prices. As would be expected for a period so short as 1948–53, the difference between base-year and end-year weighting is small—though even so, not insignificant, but the spread that he shows in applying his price indexes to compare Hoeffding's 1928 figure for gross national product with Bergson's datum for 1937 is a further vindication of Gerschenkron's hypothesis of inherent index number bias: on base-year weights the rise is 115% but on end-year weights only 58%. For his rate of growth Wiles uses the geometric mean of the two.

An impressive series of summary breakdowns of Soviet national product by use and by origin has been prepared by Block.[2] He has extended, with small modifications, Bergson's adjusted factor cost measures to 1953 but as yet only the results of his computations have been published.

Much less detailed accounts, also at current market prices, had earlier been prepared for 1940 by Baran,[3] Rosen [4] and Wyler.[5] Baran's object was not so much to prepare an account as to piece together items of national outlay for the sake of the total (used for comparison with United States magnitudes). Rosen's objective was more limited—to relate a breakdown by use, given by the then Chairman of the Soviet State Planning Commission,[6] to current price outlays, but he based his computation on an error (confusing State investment with total "accumulation") and "proved it" by circular argument. A similar error was made in a computation by Laurat,[7] who made the further error of confounding national-income figures in 1926/27 prices with budget data in current prices. Wyler, whose dollar revaluation of the Soviet national product for four inter-war years is considered in the next section, confined himself to synthesising data computed by Jasny and Baran with Soviet budget statistics: the main subject-matter of his paper was a summary review of official and non-Soviet estimates published up to 1951. Prokopovicz, in his works written outside Russia, commented on the shortcomings of the official series, and made some corrections both to his

[1] Nove's accounts have been only privately circulated, but his use-breakdown has been reproduced by Peter Wiles, *loc. cit.*

[2] Herbert Block in *Trends in Economic Growth* (Washington, 1955, pp. 16, 57, 71 and 284), prepared for the Joint Committee of the United States Congress on the Economic Report.

[3] Paul Baran, *Review of Economic Statistics*, November 1947.

[4] Julius Rosen, *Schweitzerische Zeitschrift für Volkswirtschaft und Statistik*, No. 1, 1950.

[5] Julius Wyler, *ibid.*, Nos. 5 and 6, 1951.

[6] Nikolai Voznesensky, *Voyennaya ekonomika S.S.S.R.* (Moscow, 1947).

[7] Lucien Laurat, *Bilan de vingt-cinq ans de plans quinquennaux* (Paris, 1955).

own 1913 and to the later Soviet data.[1] A rough calculation in the *Economist* of December 18, 1948, converted 1926/27 priced Soviet estimates into current roubles by applying an unexplained price index.

To the present writer's knowledge,[2] the only other rouble-priced estimates are those incidental to the rate-of-growth studies of Goldsmith and Grossman. Goldsmith [3] constructed some income figures for pre-revolutionary years in an as yet unpublished study. Grossman [4] suggested an approximation to an " ideal " measure of the rate of growth (the geometric mean of a chain index, each annual value of which is weighted according to the cost structure of that year) by taking the geometric mean of two indexes, the one using initial-year and the other final-year cost-weights, adapting Jasny's estimates for this purpose.

III

Of the estimates of Russian and Soviet national income translated into foreign values for international comparison,[5] the earliest are those of Levi,[6] now nearly a century old, and Mulhall,[7] both in terms of sterling. Goldsmith (*op. cit.*) deprecates both as rough guesses because, despite a comparison of Levi's figure with Prokopovicz's, which shows a rate of growth similar to his own computation, he finds no supporting sources and methods. It is clear, however, that Levi used estimates of household incomes stratified

[1] In *Memorandum of the Birmingham Bureau of Research on Russian Economic Conditions*, No. 3, 1931, he deflated the Soviet figures to something like factor cost by excluding excise duties (but did not add in subsidies), revised agricultural income slightly upwards and added estimates for depreciation, and certain forms of transport, postal and restaurant services where these had been covered insufficientlv (or not at all) by the Soviet data. In his *Quarterly Bulletin of Soviet Russian Economics*, March 1941, and *Histoire économique de l'U.R.S.S.* (Paris, 1952), he indicated the direction (and sometimes the rough magnitude) of the corrections to the Soviet statistics which he found necessary in each producing sector; Chapter VI of his *Russlands Volkswirtschaft unter den Sowjets* (Zurich, 1944) develops a sector breakdown of national product for five years between 1913 and 1937 based on the official figures in 1926/27 prices. Only his 1931 study presented a complete revision of the official accounts.

[2] He acknowledges with thanks the help of Professor Giorgio Fua and Drs. Lief Bjork, Eugène Zaleski and Theodor Zotschew for confirming the absence of other estimates in, respectively, the Italian, Scandinavian, French and German languages. There is, however, a growing Continental literature on Soviet national-accounting methodology, cf. Jan Marczewski, *Income and Wealth*, IV (London, 1955); Stefano Somogyi, *Critica Economica*, No. 3, 1951, and there are, naturally enough, many studies in eastern European journals.

[3] Raymond Goldsmith, *The Economic Growth of Russia 1860–1913*, paper presented to the Fourth Conference of the International Association for Research in Income and Wealth, Hindsgavl, Denmark, 1955. (Preliminary draft, privately circulated.)

[4] Gregory Grossman, " National Income " in A. Bergson (ed.), *Soviet Economic Growth* (Evanston, Ill., 1953); a Soviet notice of the book (*Planovoe Khozyaistvo*, No. 4, 1954, p. 79) observed with pleasure that " even using every device and slander to discredit Soviet statistics," the Soviet rate of growth was shown to exceed that of any capitalist country.

[5] Interspatial comparisons of the consumption sector of national income by household budget and price comparisons are excluded from the present study.

[6] Leone Levi, *Quarterly Journal of the Statistical Society*, March 1860, p. 42.

[7] Michael Mulhall, *The Dictionary of Statistics* (London, first edition 1884—fourth edition, 1909); reference here is to the fourth edition.

by class-group (his method for computing United Kingdom income in the same and later papers), and it was not much later that family budget studies were published in Russia.[1] Mulhall is clear enough on his methods, though less so on his sources, but the mystery in his figures is the inexplicable divergence between his breakdown by nine originating sectors for around 1890 (p. 320) and by eight mostly identical sectors for 1895 (p. 747): the rate of growth shown by the two estimates is, moreover, unrealistically small by reference to crop and industrial outputs of the time. No other valuation in sterling, or any other foreign money, appears to have been made until Polanyi's calculation [2] in the mid-thirties. On the consumption sector his method was reasonably sound (agricultural output valued at British wholesale prices and the annual wage-bill converted to sterling on a retail purchasing-power parity), but he confused investment with the gross value of producer goods. Clark improved upon this procedure, first in 1939 and in four subsequent revisions.[3] He avoided Polanyi's main error by valuing a sample of capital goods in sterling (in later revisions in dollars) and inflating to gross investment in the proportion shown by those goods within the United States gross investment; consumption of food and house-space was directly revalued, but for other services (including Government) he used rouble valuations converted at an estimated equivalent purchasing power. Brown [4] used Clark's 1934 and 1937 estimates, together with State budget data for rough estimates of war-time national income.

Soon after the war two dollar-valued estimates appeared. Wyler [5] adopted the technique of thorough-going revaluation: although he did not furnish details of his valuations (in 1940 dollars), he stated that:

> "the technique of conversion was adapted to the nature of the data available for each output or expenditure group. Where no measure of the quantity or quality of the output was possible, as in the case of civil servants and soldiers, an appropriate average value of the individual services was imputed. Farm operatives' income in kind was imputed at American retail prices" (p. 508).

The effect of this procedure was, in particular, to inflate, relative to Soviet values, services and farm consumption in kind. Baran (*op. cit.*), on the other hand, tried a short cut by employing a dollar–rouble conversion factor derived from a Soviet revaluation of the United States national income into

[1] Cf. A. A. Kaufman, *Statisticheskaya nauka v Rossii: teoria i metologia 1806–1917* (Moscow, 1922), pp. 70–9.

[2] Michael Polanyi, *The Manchester School*, No. 2, 1935.

[3] C. Clark, *A Critique of Russian Statistics* (London, 1939); in *Review of Economic Statistics*, November 1947, and in *The Conditions of Economic Progress* (London, 1940 and 1951); a third edition is in the press.

[4] A. J. B(rown), *Bulletin of International News*, March 4, 1944, for 1941 and 1943 estimates and A. J. Brown, *Applied Economics* (London, 1947), pp. 69 and 70, for 1941 (revised) and 1944 estimates.

[5] Julius Wyler, *Social Research*, December 1946.

roubles.[1] Jasny [2] has demonstrated the errors Baran's route involved, but believes that so far as the 1940 factor-cost estimate is concerned the errors offset each other. Baran's 1937 dollar valuation was less than it should have been because the " 1926/27 prices " used in the conversion factor with 1929 dollars was presumably the 1937 lists, and consequently included goods newly produced between 1929 and 1937 at inflated prices. On the other hand, his 1937–40 link overstated the actual increase because Baran unreservedly used the official Soviet data in " 1926/27 prices." Jasny also rightly points out that Baran's conversion of his dollar-priced national income at factor-cost into gross national product at market prices on the basis of established Soviet prices implies the same weight of indirect taxes in United States as in Soviet prices. This procedure, however, commends itself to Dobb,[3] who calls Baran's factor-cost figure very nearly a measure at prime cost, since indirect taxes might be regarded as " that part of profit (and other property income) in a capitalist economy which is devoted to capital investment." Baran's method was used in an estimate prepared by the United Nations Statistical Office for 1949,[4] primarily to assist the determination of contributions to the Organisation. The main change from the methodology used by Baran was to apply " a statistical correction for the upward trend of the index of national income in constant prices ": the magnitude of the correction was not stated. There are, finally, two dollar-priced valuations for 1953 made by Harvey and Block in the United States Department of State,[5] which differ from each other by a margin of 28%. No computation details have been published for either figure, but one may hazard a guess (see Table IV) that Harvey's is in fact based upon the United Nations estimate for 1949.

IV

As the estimates described in the preceding sections are tabulated in comparable form in an Appendix, the only commentary needed is to draw attention to methodological or conceptual features which cause significant divergence between them. In Table I the rate of growth shown by the Soviet estimates while the " 1926/27 prices " were in use (1928–50) is considerably higher than alternative estimates for the same period and for the period since the abandonment of that price valuation. In fact, the 11% annual increase shown for 1950–55 is between the 12 and 13% hazarded by Jasny for 1948–50 and the 9% shown for 1948–55 by Wiles' adaptation of

[1] By M. Kolganov, *Problemy Ekonomiki*, No. 4, 1940, p. 111. Kolganov has recently published (*Voprosy Ekonomiki*, No. 11, 1955) a reclassification of 1950 United States national income into Soviet concepts and presents it as a reply to the Bergson studies.

[2] *The Soviet Economy during the Plan Era*, pp. 38–9.

[3] *Review of Economics and Statistics*, February 1948, p. 37.

[4] United Nations, *National and Per Capita Incomes of Seventy Countries in 1949* (New York, 1950).

[5] Mose Harvey in *Industrial Russia* (*Studies in Business Economics*, No. 44, 1954), p. 7; H. Block, *op. cit.*, p. 16.

Nove's estimates. The rates of growth shown between the start of the First Five-year Plan and the war are greater in the rouble valuations (Grossman, Jasny and Wiles) than those in dollar prices (Clark and Wyler), since the latter are those of a more developed industrial structure.

An interesting feature of Table II is the quantitative difference between the Soviet and " bourgeois " concepts of the national product, *i.e.*, the value of " non-material services " excluded from the Soviet accounts. Seton and Bergson showed the addition to net material product to be almost one-fifth in 1934 and 1937 if measured in Soviet established prices, compared with 23·5% in Hoeffding's study of 1928. The differential is larger at factor cost because the incidence of indirect tax is heavier upon material production.[1] Jasny's computation of this margin is methodologically unsatisfactory. A recent recalculation of the 1950 United States national income to the Soviet concept by a well-known Soviet statistician [2] shows a difference of 27·5%, but it must be borne in mind that services occupy a larger place in the United States than in the Soviet economy. The variations between the origin breakdowns shown by the available estimates up to 1928 may be ascribed to relatively minor differences in accuracy and definition (*e.g.*, of transport), but the decline in the relative share of agriculture as collectivisation temporarily reduced output and as industry expanded after 1928 is very differently assessed. Jasny, using his " real 1926/27 prices," shows an even more rapid fall than the Gosplan estimates in the official " 1926/27 prices " and Bergson in established prices. Bergson's revaluation of farm consumption and elimination of turnover taxes from manufacturing considerably raises the agricultural at the expense of the industrial share.

Similarly the exclusion of turnover taxes sharply reduces the indicated share of consumption (Table III). The lowest share is shown by Jasny for 1948, computed in prices of a year when indirect taxes were very light, but Bergson and Heymann also indicate a low proportion, the main element in their adjusted factor cost being the deduction of turnover taxes: inclusion of these taxes (by them and by Nove) raises its share by 13 points. Clark's repricing in dollar values also diminishes consumption, since the tax element in those prices is relatively lower than in the Soviet Union, but not so much as by Wyler, despite his revaluation of food consumption on farms at retail prices.

The most uncertain set of estimates are those which try to situate the Soviet income magnitudes into international comparison. It has been shown that the size of a national product in relation to that of a more-industrialised economy is higher when valued in the prices of a more-industrialised economy (or in domestic prices of a later stage in industrialisation) than when valued in prices of a less-industrialised economy (or

[1] Bergson ignores the tax on " non-merchandise operations," which is the form of turnover tax levied on services, but the effect is insignificant.

[2] M. Kolganov, *Voprosy Ekonomiki*, *loc. cit.*

earlier stage).[1] Both using United States prices Clark and Wyler nevertheless obtain for the inter-war period quite different magnitudes—the latter exceeding the former in 1940 by more than one-third. Wyler attributes the discrepancy to different index-number usage and inaccuracies in the basic statistics used by Clark. Block [2] used Jasny's Soviet-priced and Clark's American-priced estimates for a comparison of Soviet net national product with that of the United States: for 1928 and 1937 respectively the Soviet-priced set showed 15% and 25% while the American-priced set showed 30% and 37%. For the post-war years rough estimates are available in both Soviet and foreign prices and, if only an order of magnitude is required, the Soviet national product at United States prices seems to be one-third the size of the United States product, and at Soviet prices one-quarter the size.

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APPENDIX

The price bases of the computations of Soviet national income reproduced in Tables II and III are indicated as follows: * denotes current prices, † denotes prices of a different year and ‡ denotes valuation in a foreign currency.

TABLE I

Annual Average Rate of Growth of Net National Product % per annum

From: / To:	1870 1885	1885 1900	1900 1913	1928 1937	1937 1940	1948 1950	1950 1955
Soviet official	—	—	2½	16	9	19	11
Clark, 1951 [a]	—	—	—	4½	8	—	—
Clark, 1951 [b]	—	—	—	2½	7	—	—
Grossman, 1954	—	—	—	7	—	7	—
Jasny, 1951 [c]	—	—	—	8	6½	—	—
Jasny, 1951, 1954 [d]	—	—	—	9	7	12½ [e]	—
Wyler, 1946 [f]	—	—	—	7	6	—	—
Wyler, 1951 [g]	—	—	—	5½	8	—	—
Block, 1955	—	—	—	—	—	10	6[h]
Composite	3½[i]		4½[i]	7[j]	—	9[j]	

[a] Valuation in United States dollar prices.
[b] With Fisher-type allowance for valuation in rouble prices.
[c] Distribution method. [d] Production method. [e] 12–13%.
[f] National income. [g] Social product. [h] 1950–53.
[i] Relationship of 1860 (Levi), 1895 (Mulhall) and 1913 (Clark) converted into dollars at contemporary exchange-rates and inflated by United States price-index to a common year.
[j] Relationship of 1928 (Hoeffding), 1937 (Bergson), 1948 and 1953 (both Nove) converted into comparable prices by Wiles, 1955.

[1] But the rate of growth is lower. For a discussion of this problem with particular reference to comparisons between the Soviet Union and the United States see *Trends in Economic Growth*, *op. cit.*, pp. 54–9.

[2] *Op. cit.*, p. 57.

TABLE II

Net National Product by Origin

Percentages of net material product [a]

Year and source.	Agri-culture.	Industry.[b]	Con-struction.	Transport and com-munica-tions.[c]	Trade.	Services.
At market prices :						
1895 (Mulhall, 1909) ‡ .	43·6	32·8		9·7	13·9	35·1
1900 (Prokopovicz, 1906) *	45·4	30·8	7·2	8·1	8·5	—
1913 (Prokopovicz, 1918) *	47·7	27·9	7·2	8·9	8·3	—
1925/26 (Gosplan, 1929) *	45·9	33·5	5·0	2·4	13·2	—
1928/29 (Gosplan, 1929) *	39·5	39·0	6·5	3·2	11·8	—
1928 [d] (Hoeffding, 1954) *.	40·7 [e]	45·1		5·7 [f]	8·5	23·5
1934 (Gosplan, 1936) † .	16·8	51·9	12·0	5·4	13·9	—
(Seton, 1954) * .	27·9	49·3	7·6	4·6	10·6	19·5
1937 [d] (Gosplan, 1939) † .	25·7	56·0	5·8	3·0	9·5	—
(Bergson, 1953) * .	26·2	58·1		4·7 [f]	11·0	19·6
(Jasny, 1951) † .	19·4	52·4	10·9	9·8	7·5	10·0
1940 (Jasny, 1951) † .	18·6	55·2	9·4	10·1	6·7	11·0
At adjusted factor cost [g] :						
1928 (Hoeffding, 1954) * .	45·3	41·5		6·0 [f]	7·2	25·2
1937 (Bergson, 1953) * .	39·8	47·1		6·8 [f]	6·3	27·7

[a] *I.e.*, Soviet definition of national product.

[b] Including forestry, fisheries and public utilities.

[c] Freight carriage; the distribution of communications between this head and "services" varies, but no adjustment has been attempted because exact data are lacking and the quantities involved are small.

[d] Clark, 1951, gives the following distribution of net national product:

	1928.	1938.
Agriculture, forestry and fisheries . .	36·7	25·9
Large-scale manufacture	9·4	20·0
Other manufacturing and services . .	53·9	54·1

[e] Forestry and fisheries (included with agriculture by Hoeffding) transferred to industry on the basis of Gosplan data for the same year.

[f] Use by individuals of transport and communications transferred to services, at an estimated one-third of total (as shown by Seton, *op. cit.*, for 1934).

[g] Block, 1955, uses this adjusted factor cost (with higher imputed land rent than Bergson) for the following distribution of net national product:

	1937.	1948.	1953.
Agriculture	36	28	23
Industry	34	36	46
Transport and communications .	7	8	10
Trade and services . . .	22	28	21

TABLE III

Gross National Product by Use

Percentages of net national product

Year and source.	Consumption.	Social services.	Administration.[a]	Defence.[b]	Net investment.	Depreciation.
At market prices :						
1928 (Hoeffding, 1954) *	75·6	5·4	2·7	2·5	13·8	8·9
(Jasny, 1951) †	73·4	4·9	2·5[c]	2·4	16·8	—
(Wyler, 1946) ‡	72·9	10·4		4·0	6·4	—
1934 (Wyler, 1946) ‡	62·2	18·3		6·1	13·4	—
(Clark, 1947) ‡	69·4	15·8			13·8	—
(Seton, 1954) *	65·9	6·4	1·5	3·7	22·5	5·5
1937 (Bergson, 1953) *	64·1	9·6	2·6	6·1	17·6	2·0
(Jasny, 1951) †	41·2	7·4	2·5[c]	10·0	38·9	—
(Wyler, 1946) ‡	58·2	18·2		11·4	12·2	—
1938 (Clark, 1947) ‡	66·7	21·0			12·3	—
1940 (Bergson, Heymann, 1954) *	64·8	8·2	3·1	12·7	11·2	2·9
(Wyler, 1946) ‡	44·1	18·2		25·0	12·7	—
1941 (Brown, 1947) ‡	58·5		7·5	18·0[d]	16·0	—
1943 (Brown, 1944) ‡	55·0		7·0	30·0[d]	8·0	—
1944 (Brown, 1947) ‡	51·0		7·0	32·5[d]	9·5	—
(Bergson, Heymann, 1954) *	52·2	6·5	2·9	28·9	9·4	2·3
1948 (Bergson, Heymann, 1954) *	59·0	10·7	4·9	8·3	17·1	1·8
(Jasny, 1951) †	30·7	7·4	3·3[c]	19·2	39·4	—
(Nove, 1955) †	60·6	15·4		7·5	16·5	0·6[e]
1953 (Nove, 1955) †	54·7	15·3		10·3	19·7	1·5[e]
At adjusted factor cost :						
1928 (Hoeffding, 1954) *	73·0	5·7	2·9	2·7	15·7	9·8
1937 (Bergson, 1953) *	57·2	10·9	3·2	7·9	20·8	2·7
1940 (Bergson, Heymann, 1954) *	57·3	9·3	3·7	16·2	13·5	3·7
1944 (Bergson, Heymann, 1954) *	42·4	7·8	3·5	35·2	11·1	2·8
1948 (Bergson, Heymann, 1954) *	46·3	11·9	6·0	11·9	23·9	2·3
(Block, 1955) [f] *	49	10	5	15	21	(2·3)
1953 (Block, 1955) [f] *	48	8	4	16	24	(2·3)

[a] Including internal security services.
[b] Outlays classified as defence in the State Budget, but excluding pay and subsistence.
[c] In the absence of a computation by Jasny, outlays on administration have been estimated as bearing the same relation to social services as they showed in current prices.
[d] Military pay and subsistence have been computed as the share of total defence outlay (in which they were included by Brown) shown by Bergson and Heymann and transferred to consumption.
[e] As recorded in the books of Soviet enterprises.
[f] Percentages of gross national product deflated to net by the Bergson, Heymann depreciation estimate for 1948.

TABLE IV

Valuation of National Income in United States Dollars of 1953 *Purchasing Power*

Billions of dollars

	Net national income.		Gross national product.	
	Soviet factor cost.	Foreign market prices.	Soviet market prices.	Foreign market prices.
1860	—	6 [a]	—	—
1895	—	18 [b]	—	—
1913	—	40 [c]	—	—
1928	—	41,[c] 46 [d]	—	—
1937	—	56,[c] 85 [d]	—	—
1940	70 [e]	75,[e] 102 [d]	100[e]	—
1944	—	76 [f]	—	—
1949	66 [g]	—	—	—
1953	86 [h]	—	—	110 [i]

Note. The price index used to inflate to 1953 prices is that of the United States Bureau of Labor Statistics; sterling valuations have been converted to dollars at the contemporary exchange-rate.

[a] Levi, 1860.
[b] Mulhall, 1909.
[c] Clark, 1951 (using only his values directly using United States dollar prices: his adjustment for rouble-price valuation was not suitable for inflation to 1953 United States prices).
[d] Wyler, 1946.
[e] Baran, 1947.
[f] Brown, 1947.
[g] United Nations, 1950.
[h] Harvey, 1954. This coincides exactly with an inflation of the United Nations, 1950, estimate for 1949, by an index in Soviet factor costs computed by Block, 1955.
[i] Block, 1955.

REVIEWS

Policies to Combat Depression. A Conference of the Universities–National Bureau Committee for Economic Research. (Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1956. Pp. 417. 68*s*.)

THE fourteen papers brought together in this volume were presented at two conferences at Princeton in the autumn of 1953 and the spring of 1954. As the title indicates, the purpose of the conference was " to survey the existing state of readiness to deal with the problem of depression, in terms both of understanding the problem and the availability of instruments to deal with it." It should perhaps be added that the material relates entirely to the United States.

The papers fall into two groups. The first three, by Gordon, Caplan and Boulding, examine the various types of depressions in the past, ask which are likely to be repeated in the future and discuss in general terms the most suitable types of remedies. The remaining eleven deal with more specific measures and examine their likely degree of effectiveness with great thoroughness. One of the most interesting is " The Stabilising Effectiveness of Budget Flexibility," by Lusher. He attempts a statistical estimate of the stabilising properties of United States Government revenues and expenditure and comes out with the result that in a recession the decline in GNP will be mitigated by 30–40%: the actual decline in GNP, that is to say, will be 30–40% less than it would be without the stabilising effect of Government revenues and expenditures. This is a remarkable and far too little understood change compared to the position at the beginning of the 1930s, when United States Government budgets *aggravated* the downturn by some 10–20%. The paper by Goode—" The Corporate Income Tax in a Depression "—offers some interesting, though non-statistical, analyses of the ways in which the corporation tax assists, or could be made to assist, in the process of built-in flexibility. Other papers deal with the role of income tax in a depression, the place of social-security programmes, farm-price-support programmes and so on. Whilst these all maintain a high standard of discussion, it is somewhat aggravating to find that the paper by Roosa on " The Role of Monetary Policy," which one suspects may have been one of the most interesting, is reproduced only in abstract form.

Enough has been said to indicate that this is an unusually good symposium. Indeed, it is a good deal better than the results of a conference have a right to be! Two final reflections remain. The first is that surely one of the best guarantees the world has against an acute American recession is that Americans are prepared to give so much thought to the subject.

Second, is there any prospect of a corresponding amount of knowledge and thought on these lines being built up in this country, or for that matter, any country in Western Europe?

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The Economics of Repressed Inflation. By H. K. CHARLESWORTH. (London: Allen & Unwin, 1956. Pp. 126. 13*s.* 6*d.*)

Inflation and Capital. By F. V. MEYER. (Cambridge: Bowes & Bowes, 1954. Pp. 75. 12*s.* 6*d.*)

FOR the importance of the subject—and for its practical significance to economists, a predominantly fixed-income profession—the quantity of the economic literature on inflation is remarkably small. Our knowledge of it needs building up in both of two ways: through theoretical analysis of its processes, in which attention to the timing of its phases will be more revealing than methods of general equilibrium analysis, and through case-studies. In recent years Bent Hansen's *Study in the Theory of Inflation* has provided an example of the first, and A. J. Brown's *The Great Inflation* of the second. Mr. Charlesworth chooses his ground well in confining his study to what is likely in practice to be the relevant case: the case where inflationary pressures, for social reasons, will neither be allowed to work themselves out fully in the open nor can be entirely bottled up by a total (or totalitarian) system of controls, but where in some part of the economy natural forces are thwarted by rationing, allocations and price control. But he makes the mistake of falling heavily between the two methods of approach suggested above. His mind is obviously dominated by the experience of the United Kingdom in the period from 1939 to 1950, but he does not offer us a case-study of what actually happened in that period. He uses it instead as a springboard for a theoretical discussion of the effects of a partial repression of inflation on savings and the supply and productivity of factors. His theoretical discussion, however, is apt to be confused by particular features of the period he has in mind which have no close relevance to the problems he is trying to elucidate. Thus he is apt to bring in observations about the supposed effects of a highly progressive system of taxation of income or of heavy "social" investment, which, while they may be highly relevant to an understanding of the economic history which is in the forefront of his mind, and may be important causes of the inflationary situation which gives him his starting-point, are not particularly relevant to the results of dealing with that situation by the method of partial repression. He is inspired by a particular case and attempts a general discussion; but he fails to keep the two distinct. He indulges in considerable diagrammatics to establish points about the distorting effects of controls which are by now familiar; there is little effort

to tackle the much more important, and little studied, questions concerning what makes these distortions mild in some cases and deadly in others. Mr. Charlesworth is one of those economists who are apt to be more excited by the existence of distortions than by their size. Nor is his analysis impeccable. He comes close to confusing the marginal utility of income with the marginal utility of money (pp. 31–2); and he is capable of such appallingly loose sentences as: "the quantity which will be consumed is that at which the price is equal to the relative marginal utility" (p. 70). When discussing a totally repressed inflation, where there is a fixed ration of every good, he states that the supply curve of labour will be infinitely inelastic (p. 35). In fact, he means it will have an elasticity of minus one. This mistake is repeated in the diagram on p. 41.

The main object of Mr. Meyer's monograph is to present estimates of the national capital in 1938 and the post-war years up to 1952. His method is to use *The Economist*'s computations of industrial profits and the profits figures in the National Income Blue Book. The latter divided by the former is used as a factor to gross up the capital of the companies in *The Economist*'s sample. The capital which is thus grossed up, however, is their issued capital. So what we have are estimates of issued industrial capital. The national capital is a concept which usually has about it the aura of something more "real" (in some sense) than the capital that a firm has issued; it is about machines, not about paper. Measuring the paper may be a good way of learning something about the machines. But one would expect someone who thought so to spend some time discussing this view and justifying it to his readers. Mr. Meyer gives it a footnote. He is almost equally terse with other statistical questions, including the vital one of the price indices to be used in obtaining estimates of the real national capital; these are given three lines of a footnote in a table. His first estimates he later refines by making a distinction between the National Capital Stock and the Real National Capital. This appears to be based in the idea that profits are a function both of the quantity of capital and of its profitability, so that if you want to use profits as an index of the quantity of capital you must discount them for changes in its profitability. But this has to be puzzled out by the reader himself almost entirely unaided by the text. One can forgive statisticians for making mistakes, but not for failing to reveal their hands. Certainly Mr. Meyer's results look peculiar. They show the national capital in 1952 as being substantially less in real terms than in 1938, and less indeed than in 1946, both of which results are contradicted by Mr. Redfern's calculations (*J.R.S.S.*, 1956). By implication, Mr. Meyer's title lays this at the door of inflation; but the discussion in the first chapters of his book does not illuminate the connection.

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Post Keynesian Economics. Edited by K. K. KURIHARA. (New Brunswick, New Jersey: Rutgers University Press, 1954 (London: Allen & Unwin, 1955). Pp. vii + 442. 30*s*.)

IN his preface the editor states that " this volume represents the extension of Keynes' *General Theory* by a group of well-known economists." There are fifteen essays in all, subdivided into three sections of five. From the list of contributors one gains the impression that most, if not all, have yet to reach the half-way stage in their active careers—literally post-Keynesian economists!

In place of an essay-by-essay commentary, reference will be made to only seven selected in such a way as to indicate the range of the volume, the strength of its contribution to thought, divergent methods of analysis and last, but one hopes least, the predilections of the reviewer.

Part I concentrates upon monetary theory and policy. An essay by Professor Don Patinkin on " Keynesian Economics and the Quantity Theory " queries the range of assumptions necessary for the validity of the Quantity Theory under full employment. He maintains that two only are required, full employment and absence of money illusion, whereas Keynes stressed the need to assume that the propensity to hoard is always zero in equilibrium and that effective demand increases in the same proportion as the quantity of money, the latter depending upon the shapes of the consumption, investment and liquidity-preference functions. Professor Patinkin's analysis contains certain non-Keynesian elements, notably the dependence of expenditure functions upon real money balances. There are two essays on inflation, in one of which Professor Martin Bronfenbrenner discusses problems posed in contemporary capitalist society by a persistent tendency towards secular inflation. He proceeds to forecast that secular inflation will come to an end when the limited gains to labour from a wage-price spiral become sufficiently evident. Workers will then endeavour to increase their share of the national income at the direct expense of property interests, and either Labourism or Fascism will triumph according to the relative strength of labour and property interests. One might argue that to some extent some decline in the share accruing to property might be tolerated by that group in view of the reduction of uncertainty through full employment. The style of this essay bears close affinity to that of Keynes when he is speculating upon the future of capitalism.

Part II is concerned with economic fluctuations and growth. Mr. R. C. O. Matthews discusses the policy implications of recent trade-cycle models of the Hicks–Goodwin–Kaldor type when the aim is to set and maintain activity (growth considerations apart) at full-employment levels. The nature of stability at full employment is examined under two hypotheses, damped cycles with erratic shocks and explosive cycles with ceiling constraints. Quite apart from considerations of inflationary instability, it is

shown that the policy position cannot be considered necessarily stable. The author suggests measures of restraint over private investment as the most appropriate policy procedure in these circumstances, since in present conditions there is more likelihood of upwards instability through the threat of inflation than of downwards instability. Moreover, the authorities are then more strongly placed to counter any downwards instability by fresh investment. This lucidly written paper provides in addition a good critical assessment of current trade-cycle theory. This may also be said of the succeeding paper by Professor S. Ichimura, which traces the central elements of this same group of theories in mathematical terms. The writer's purpose is to examine the cyclical properties of these essentially non-linear models and to ascertain whether they give rise to unique limit cycles: to cycles, that is, of constant amplitude and fixed period independent of initial conditions. He concludes that for the Hicks–Goodwin theories there is a possibility of two or more limit cycles, which, however, appear to be encircled by a stable limit-cycle zone. For a more general cycle theory Professor Ichimura has been able to show that limit cycles exist but has not been able to demonstrate uniqueness. This reviewer is not clear as to the objection to multiple-limit cycles *per se* if it could be shown that the degree of variation is sufficiently small. One objection to his essay may be raised. In his analysis of the Hicks model he retains the autonomous investment function but fails to take account of subsequent criticism that in that model autonomous investment is income but not capital creating. It would be interesting to know the nature of the limit cycles when the model is suitably amended.

Part III, entitled " Aggregative Economics and Testing," is the most rewarding. It contains in an essay by Dr. L. R. Klein an authoritative summary of the essential elements in the *General Theory*, combined with a discriminatory assessment of improvements to that theory in so far as theoretical suggestion has been backed by empirical support. The writer emphasises that the main tenets of the theory remain unimpaired. The essay is concluded with the empirical estimates of a new econometric model for the United States covering the years 1929–41 and 1946–50. In completely different vein Mr. Paul Streeten contributes a philosophical essay upon the contrast between the value premises implicit in Keynes' writing and those of classical British economic thought. He classes Keynes as a liberal-utilitarian accepting the doctrine of harmony of interests. He considers that the doctrine of harmony was more acceptable in the period of unemployment when the *General Theory* was written than in subsequent periods when Keynesian remedies for economic malaise have been in operation.

The last essay in this volume, " Utility Analysis and the Consumption Function," by Professor F. Modigliani and the late Dr. R. E. Brumberg, is also the most important. It presents a new hypothesis to help resolve the consumption-function controversy which has arisen through difficulties in

interpreting post-war data and apparent inconsistencies between time series and family-budget material. Using a restricted utility function containing consumption in each year of an individual's life from the planning date, there is shown to be a simple relation between current real consumption and expected real resources (incomes, expected incomes and current assets) the coefficient of which depends solely upon the remaining expected life. It is shown how under stationary income conditions the proportion of income saved is independent of income. Moreover, " Systematic deviations of the saving ratio from the normal level are largely accounted for by the fact that short-term fluctuations of income around the basic earning capacity of the household, as well as gradual changes in this earning capacity, may cause accumulated savings to get out of line with current income and age " (p. 430). This essay, one of a pair, is concerned solely with the interpretation of family-budget studies. Built upon traditional utility theory, in which one consumer's preferences are assumed independent of others, it brings into relief the respective influences of the components of expected resources and age and emphasises resources not current income as the principal influence upon savings patterns. This thesis, if empirically supported, has important implications for the redistribution policy that is currently based on the Keynesian suggestion that the marginal propensity to save increases with income. It is unfortunate that this essay, through its form of presentation, makes unduly heavy demands upon the reader.

There are sufficient good contributions, together with one or two outstanding ones, to establish this volume's right to a place on any economist's bookshelf.

MALCOLM R. FISHER

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Economic Co-operation in Europe. A study of the United Nations Economic Commission for Europe. By DAVID WIGHTMAN. (London: Stevens and Sons and William Heinemann, 1956. Pp. xi + 288. 21*s.*)

THIS book, as its blurb explains, " tries to find reasons for the astonishing vitality of E.C.E. in the face of very unfavourable political circumstances " and indeed tries so hard that it almost damns with excessive praise. For the E.C.E.'s greatest claim to fame, its Research Division, receives scant attention (and not a word about Mr. Kaldor), while its various Technical Committees were mostly *not* able to maintain their vitality in the unfavourable political circumstances of the Cold War, as the well-documented Part Three, on " Co-operation in Practice," all too clearly shows.

One suspects that Mr. Wightman has not been able to dissociate himself from the viewpoint of his hosts at the *Palais des Nations*, which is, first, that the E.C.E. must not be judged as a research organisation, but as an organisation which gets things done; second, that it is the Technical Committees which provide the machinery for getting things done; and third, that these

Committees do in fact get important things done, despite (or rather because of) the fact that they operate out of the limelight in closed sessions, and deal with matters too technical to get into newspaper headlines.

But though apparently subscribing to these propositions, Mr. Wightman steadily erodes our confidence in the last (and crucial) one, for he has constantly to make reservations, and anyway, the facts (presented with clarity and impartiality) speak for themselves. For the truth is that the E.C.E., after making a highly creditable start (by assisting member governments to deal with " bottleneck problems "), fell victim to the Cold War, and has not yet recovered. In circumstances described in Chapter 2, and which give ample opportunity for speculating about historical might-have-beens, the agency selected for distributing Marshall Aid was not the E.C.E. but a new body, the O.E.E.C., set up in Paris for the purpose. Thereafter, European co-operation became West European co-operation, centred on Paris (and later also on Luxemburg) instead of Geneva. West European organisations proliferated (with N.A.T.O., E.P.U., E.P.A. and E.C.S.C.) and E.C.E. languished. More and more E.C.E. became a stand-by organisation, to be kept in being as a possible bridge over the Iron Curtain: hence the great emphasis laid by the Secretariat on East–West trade. Then, with the movement towards " peaceful co-existence," E.C.E.'s prospects seemed to brighten, especially since (beginning with the eighth session of the Commission in March 1953) Russia and her allies began to take a less acrimonious line in public sessions and to send their experts once again to sit on the Technical Committees. Nevertheless, though this increased the political importance of the E.C.E., there is little evidence that the E.C.E. has yet provided the machinery for much economic co-operation between East and West, whether in trade, payments or anything else.

This book is a most valuable case study in European economic co-operation, and whets one's appetite for a companion study on the O.E.E.C.

BRIAN TEW

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The Value Judgement. By W. D. LAMONT. (Edinburgh: The University Press, 1955. Pp. xv + 335.)

IT is very much to be hoped that those economists who are interested in the logical and semantic foundations of economic theory will read this book with open and receptive minds, and not allow feelings of exasperation and bewilderment to stop them at about p. 74. For Dr. Lamont has an important chain of questions to ask, and the fact that he has mixed it up with all sorts of unreal difficulties and groundless complaints against economists does not lessen its interest. The first question is: By what right do we assume that it makes sense in logic for the individual to take *any pair whatsoever* of the objects of consumption (the quantitative items) which might appear in his budget, and set a higher or lower subjective, private, personal valuation on

one of them than on the other? In other words, what right have we to assume that all the possible items of consumption are well ordered, as the mathematicians say, in his estimation? This possibility, of comparative valuation of two items, exists *prima facie*, Dr. Lamont says, only if the two items belong to one and the same " valuational order," that is, if they meet the same basic need, as for instance, the need for sustenance, or the need for mental occupation, or the need for personal transportation. Now in so far as this is true, namely that all objects which can be comparatively valued against each other by the individual (in his private capacity: valuation in the market is not here in question) must be ones which serve the same ultimate, fundamental need of his, it follows that we can mark off a particular chunk of this need (say the need for a pint of water to drink) and compare the various ways of meeting this need, that is, the various goods or objects, according to their *opportunity-cost*, the sacrifice, that each one entails, of other possibilities of meeting this same ultimate need. Thus we can conclude (*Proposition V*, p. 73) that " The order of value is the inverse of the order of opportunity-costs," or " . . . if we know that the cost of x is estimated higher than the cost of y, we know at the same time that the person making the estimate will place y higher than x on his valuation scale. . . . If the descending order of estimated opportunity-costs is A, B, C, D, then the descending order of values will be D, C, B, A."

I can only hope that this drastic compression of Dr. Lamont's thesis, ending with a bald quotation unsupported by his careful structure of argument, will not give an entirely false impression of his line of thought. There is only space now to refer to some of the more serious doubts and objections that arise even in the mind of a reader who is willing to surrender himself to the current of the author's thought; and after that to sketch the lines of defence of orthodox economics against some of the author's more baseless charges and indicate what seem to me to be his misconceptions.

Perhaps the most important question that will trouble an economist is how a person can ever arrive at a determinate, uniquely " best " consumption-budget or " shopping list," that is, a plan for spending a given income, if there exist side-by-side in his mind several quite independent valuation-orders *between* which there is no means of making comparisons. Dr. Lamont has gone far to meet this difficulty by suggesting that, in the last analysis, the various separate valuational orders (each resting upon the degree to which various goods, in the ordinary sense, can satisfy a given " chunk " of some " common demand " or single end which all these goods are really intended to serve) are united by some superior, all-embracing end, the " *summum bonum*," the individual's " total conception of the good," his " search for total happiness." In this suggestion there lies, I think, the strongest recommendation of his scheme of thought and, from the point of view of orthodox economic ideas, its greatest novelty. Moral philosophers may (one can scarcely doubt it) often and long since have had this idea in mind; but the modern economic theoretician, manipulating his technical apparatus of indifference-curves, may well lose sight of the need to answer

the question: Why, ultimately, is it possible for me to compare the significance to me of a tub of butter and a symphony concert?

But when we reach this vantage-point another difficulty comes into view: so long as the "common demand" is something as simple as the need for, say, the quenching of thirst (which can according to the physiologists be satisfied by water and by nothing else), it may be easy enough to argue that if well A is more accessible than well B, a pint of water from the former is to be preferred to a pint got from the latter, because its opportunity-cost is less, and, if you like, we can fetch two pints from the nearer well with the same effort and time that would get one pint from the distant well. But how does this notion look when the "common demand" is something as complex as the individual's "total happiness" or "total idea of the good"? How, *then*, can he measure opportunity-cost, without invoking some mental process or form of judgment which will amount to that very kind of *positive*, self-subsistent valuation which Dr. Lamont is mainly concerned, it seems, to discard. Indeed, he seems to have an inkling of this difficulty, for he says (pp. 171–2) in one of his illustrations:

> "If our high-souled artist is wealthy, he can probably devote himself to the pursuit of pure art and posthumous fame. But if he is poor, he cannot ignore the fact that one of the subsidiary demands expressive of his principal demand for a dedicated life is the demand for life itself. He will have to clarify this principal demand sufficiently to get its various aspects or items into perspective. . . . When the main pattern of the principal demand has been roughed out, the technical calculations as to resources will have to be faced; and then will come the valuation of this as against that, a little more of one thing as against another, in order to reach the best adjustment for the life envisaged as a whole."

Now what are the methods and nature of this valuation, if they are different from those which the economist has always assumed to belong to the inherent and essential powers of the human mind and personality? And if they are *not* different, then why need we follow an arduous route to the conclusion that, in flat contradiction of the great insights which Gossen, Jevons, Menger, Walras and Marshall gave us eighty years or more ago, valuation is simply a matter of cost?

Whatever answer we may finally give to this question, no one will wish to deny to Dr. Lamont the credit of having started in the minds of economists an insistent train of questioning thought about the foundations of their subject. But I think that any economist, set to review this book, would be failing in his duty if he did not point out that in very many directions Dr. Lamont has completely misconceived what economists do and say, and has introduced into his dissertation "proofs" or illustrations which collapse at a touch. I do not wish to make heavy weather of this, and three or four examples selected from some thirty individual places where I have noted them will serve.

On pp. 91–3 he argues that because a person pays the same price for the

marginal as for the intra-marginal units of a commodity, the marginal unit must have for him no less " desiredness " than the intra-marginal units. On p. 106 some light is thrown on this contention by a reference to " the curious concept of ' surplus value.' " I think consumer's surplus is meant. The same argument recurs on p. 109.

On pp. 111 and 112 a strange oversight has led him to argue thus:

> " When resources are superabundant . . . the problem of distribution of these resources over the demands will be purely ' technical ' or ' administrative ' and not ' economic.' Calculation and judgement will indeed be required. Thus, if I have free access to unlimited supplies, and am proposing a week's trek in the wilds, I shall need to sit down and calculate how much of various things I require to take with me in order to meet in full all the demands likely to arise in the course of the week. These problems are technical or administrative rather than economic, for there is no question of scarcity, no question of opportunity cost for one demand in devoting resources to the satisfaction of another, no question therefore of evaluating the contents of the different demands against each other. Here there is no place for the marginal unit, however much I may be pre-occupied in calculating what would be the ' last unit ' sufficient to meet all demand up to satiation-point."

" *No question of scarcity* " ? Then why not simply take far more than enough of everything, why bother to calculate at all? Of course, the author is unconsciously assuming that there *is* a scarcity: of transport.

Through long stretches of the argument an astonishing proposition is taken for granted without discussion, and regarded apparently as self-evident, namely that if the individual's desire for commodity A would be completely satiated by, say, 20 units of A, and likewise his desire for B would be satiated by 10 units of B, then if his means are scarce so that he cannot in fact satiate all his desires, he will in equilibrium be found to buy twice as many units of A as of B, no matter whether the actual quantities are 10A and 5B, or 2A and 1B, or anything else. On p. 118 we read: " This *a priori* postulate is one which is integral to economic theory."

But enough. This book may well make an economist dizzy, but at the end, if he sticks it out, he will surely feel that he has been taken for a ride full of interest and stimulation, and given the starting-points for lines of thought that he will not be able to resist pursuing.

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The Economics of European Air Transport. By Stephen Wheatcroft. (Manchester: Manchester University Press, 1956. Pp. xxii + 358. 35*s*.)

This book fills a surprisingly large gap, for on this side of the Atlantic the air transport industry has been very inadequately studied. Mr. Wheatcroft has deliberately not written a general text-book; as a consequence, what one learns of air economics is refreshingly founded upon

concrete cases. Moreover, for the student of applied economics there could be few better reminders of the continuous interaction of politics and of technology with his subject.

The book is addressed, with something of a missionary ardour, to those concerned at all levels with the organisation of air transport services. Its main thesis is that over-extension of the route network is responsible for the airlines' failure to achieve economies of scale which could rescue them from their financial difficulties; and that this aspect, unlike the often-blamed short-haul nature of their operations, can and should be regulated. In scope therefore the work is rather narrower than its title suggests. Attention is explicitly confined to the passenger-carrying activities of scheduled airlines within Europe, and excludes much discussion of topics relevant to the economic picture as a whole, such as the integration of long- and short-haul services, the economics of aerodrome provision, the financial results and resources of the companies, and the relationship of the industry to its manufacturers of aircraft. The author's close ties with the industry may explain some of this reticence.

Within these limits Mr. Wheatcroft writes as an economist. He shows where economic arguments are over-ridden by other considerations; he points out that the concept of the public interest should take into account consumers' sovereignty in the choice of what they pay for; and he stresses frequently the role which price variations can play in bringing this about. For the most part he expounds these ideas in their practical context in a way which is certain to further the economic education of his public, though here and there he falls from grace with expressions such as "should," "ought" or "minimum essential," where economic analysis would not require it.

Part I is a description of the industry and an analysis of the economic factors influencing its operation. Here the author recognises that the factual basis is sadly limited by the unwillingness of airlines other than B.E.A. to disclose facts. Nevertheless, he has presented much information which is hard to get—his research into fare structure is particularly valuable —and he has provided some impressive contrasts with the high utilisation by United States airlines both of aircraft and stations. These he treats in some detail as indicative of the kind of economies which he believes the larger European airlines are already of a size to achieve. The chapter on size and efficiency one feels might have been improved if the author had plunged straight into his own ideas about the economies of scale in his industry. Here and elsewhere there is also a suspicion that Mr. Wheatcroft has overlooked his own warnings about the significance of market conditions, and writes as if a high cost of output reckoned simply in ton-miles necessarily implies, for example, that infrequent services or small airlines are economically inefficient. The chapters on the European fare structure and seasonal variations are fascinating, and are warmly recommended to students of like problems in other industries.

Having suggested that lower costs could be achieved through an intensification of operations, the author proceeds in Part II to discuss present restrictions upon competition. Throughout his treatment of rate-fixing by the International Air Transport Association he is insistent that scope must be found for price competition to limit the competition in quality of service now so prevalent. However, he finds that " the relatively low temperature of the competitive climate in Europe " is mainly due to the manner in which traffic rights are bargained for bilaterally. His analysis of air agreements and their provisions relating to capacity carries a convincing argument that here is a major factor responsible for too many low-frequency routes.

In Part III, " Requirements for Progress," the author outlines a system, based where possible on existing institutions, involving a multilateral air agreement and a European Commission to supervise the rationalisation of the route network, much as the Civil Aeronautics Board does internally for the United States. Mr. Wheatcroft is hopeful that co-ordination of investment plans plus an investment bank will ensure " fair and equal opportunity " for all airlines to compete, and yet retain the Bermuda philosophy of " allowing public choice of airline to be the ultimate arbiter of the division of traffic." But is it not just this choice which most protected industries fear?

All these prescriptions may sound very conservative unless the restrictionism of the present state of affairs is recalled. No one in the field of transport to-day would advocate the abandonment of all public controls. Mr. Wheatcroft has aimed at increasing the competitiveness of the industry, and has set his sights at a level which is likely to prove more of a help than a hindrance.

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Studies in the Economics of Transportation. By MARTIN BECKMANN, C. B. MCGUIRE and CHRISTOPHER B. WINSTEN. Introduction by TJALLING C. KOOPMANS. Published for Cowles Foundation for Research in Economics. (New Haven: Yale University Press (London: Oxford University Press), 1956. Pp. xix + 232. 32*s.*)

SINCE expenditure on transport absorbs about a fifth of the national income of most civilised countries, it is surprising how little is known about the economics of transportation. This book, the result of a research project carried out by the Cowles Foundation for Research in Economics under contract to the Rand Corporation, gives the result of an attempt to meet a part of the gap in our knowledge. According to the introduction to the book, one of the three authors is a mathematical economist especially interested in linear programming and economic-activity analysis, the second a mathematician and economist with a special interest in the applications of probability calculus to industrial phenomena, whilst the third is an economist

to whom was assigned special responsibility for the degree of " realism " of the models developed by the group. As might perhaps be expected with this background, the topics discussed have a strong tendency to be those that can be attacked by the methods that the authors were particularly interested in applying. Few actual data are given, whilst the theoretical approach of the authors is well illustrated by the following extract from p. 73: " two hypothetical examples are presented solely for the purposes of illustration. . . . The parameters were chosen arbitrarily and any resemblance to an actual road network is accidental."

The first part of the book starts with a discussion on the capacity of roads and intersections, then considers the demand for and the supply of road transport and so progresses to an examination of the equilibrium that is set up. The second part of the book discusses various problems relating to the economics of railway transport.

The chapter on road capacity discusses possible definitions of the term and how delay on roads varies with the amount of traffic. However, although references are made to a great deal of work published in the United States and elsewhere, the authors are clearly unaware of much important recent work on the subject outside the United States. There is no reference to the concept of " economic capacity " put forward by Schuhl (*La Route*, 1948, No. 166 bis, pp. 33–7) and defined as the amount of traffic on a road at which widening becomes economically justified taking into account the cost of widening and the benefits which would accrue, nor to the recent paper by Lighthill and Witham (*Proc. Roy. Soc. Arts*, 1955, Vol. 229, pp. 317–45), in which capacity is defined as the maximum volume of traffic that a road can carry, and it is shown that this volume is, in fact, the flow which occurs at the stop line when a queue of formerly stationary vehicles moves off.

The authors review the related literature before analysing the delay at fixed-time traffic signals and propose an ingenious method for calculating the delay, but they do not carry out the calculations. Although their review includes references to some mathematical papers by the Road Research Laboratory, no reference is made to the more recent work done on the subject by the Laboratory (*Road Research*, 1953, pp. 33–5, and *Road Research*, 1954, pp. 26–7; London, H.M.S.O.). By using a Monte Carlo method similar to that described on p. 44 of the book, where the authors describe an attempt to study the frustrations experienced by fast vehicles on a straight road, the Laboratory has produced a formula for delay under a comprehensive range of conditions which agrees well with observations. If the authors had been aware of the French and British work, they would almost certainly have written a different book.

The discussion on the demand for road transport adopts the view that vehicles are operated by people who have a range of choices available to them and are motivated by economic considerations in their decisions. Demand is regarded as a function of cost defined as the sum of operating

cost, time cost and risk cost. Since the presence of other traffic causes extra operating costs, delays and risks, the road user experiences a higher transportation cost the greater the flow. The authors find that the selection by drivers of the routes that minimise their own individual costs does not result in the division of traffic between alternative routes, which minimises the total costs incurred by road users. This is because the individual road user ignores the costs that he imposes on the others, and these costs will differ between alternative routes, being greater on a short, congested route, for example, than on a longer, less-congested route. Compared with the minimum-cost situation, therefore, there will be too much traffic on the more congested route, and to correct this the authors consider the idea of efficiency tolls, expressing the difference between marginal social and private costs. They fail, however, to find a method of solving the practical problems involved in calculating and collecting such tolls, and suggest that the problem of how to make the road user sensitive to the social cost he causes be discussed at the technological level.

The authors discuss the ways in which the demand for and the cost of road transport vary with the amount of traffic and then consider the interaction between these factors. They assume—without giving any evidence—that the demand for road transport is relatively inelastic and conclude that the equilibrium set up is stable. The discussion is not, however, very satisfying, since it is known that the supply (cost) curve is almost vertical when the traffic on a road network approaches the maximum amount that the network will carry. It is difficult, nevertheless, to understand the authors' concern for stability, since traffic appears to adjust fairly well to changes in road conditions and costs, and instability does not appear to be a pressing problem.

In spite of some unevenness in the work, for example, the tendency to give similar attention to important and unimportant questions, the authors have performed a valuable task in putting forward techniques which may be used in assessing the efficiency of road- and rail-transport systems. A more empirical approach, rather than the use of simple and rather unrealistic models, might have been more useful, but it is, nevertheless, refreshing to read a book that attempts to tackle the subject of road transport in a comprehensive and fundamental way.

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Agriculture and Industry: Relative Income. By J. R. BELLERBY and others. (London: Macmillan, 1956. Pp. 369. 30*s.*)

THIS book is a collection of reports on the statistics illustrating the size of the disparity between industrial and agricultural incomes in different countries at different periods, and on the relative importance of the causes

of that disparity. Reading straight through the book inevitably gives the impression that the job of the toiling statistician is to prove what we all know to be true, that agricultural incomes are low principally because most farmers will continue to farm in spite of low incomes; the supply price of farmers and of farm workers is low. The income disparity is smallest in countries where men are easily mobile and land is relatively plentiful, such as Australia and New Zealand; it is greatest in countries of dense population where industry is a comparatively late intruder, bringing with it a different social climate.

The main statistical argument proceeds by a comparison of the average "farm incentive income" with the average industrial income for a number of countries, and for the individual provinces of Canada. Diversions include studies of retail prices in town and country and of agricultural and urban wages. The farm incentive income is defined to exclude the return to farmers as landowners, and therefore involves the deduction from farm income of imputed rent for all owner-occupiers. This seems a reasonable process for the United Kingdom, but leads to some nice statistical problems in other countries; the social prestige of landowning in countries such as France and the expectation of capital appreciation in the mid-west of America are surely important elements in agricultural "incentive."

And even for the United Kingdom, the non-statistician, confronted with a table showing for seventy years the ratio between average farm incentive income and average industrial income, may wonder what reality is hidden behind these averages of almost infinite complexities on either side of the ratio. Yet the statistics so patiently assembled and cogently marshalled do provide a rough measure of this ratio in various countries; because they support what we all know, they do carry conviction within their own range.

The last part of the book contains a useful, though necessarily brief, discussion of what might be done, and what must not be done, if these disparities in income are to be reduced. Mr. Bellerby and his colleagues at the Agricultural Economics Research Institute are to be congratulated on the outcome of the years of statistical hard labour.

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Nigerian Cocoa Farmers. An economic survey of Yoruba cocoa farming families. By R. GALLETTI, K. D. S. BALDWIN and I. O. DINA. (London: Oxford University Press for the Nigeria Cocoa Marketing Board, 1956. Pp. v + 744. 105*s*.)

THE Nigeria Cocoa Marketing Board is charged by its Ordinance "to assist in the development by all possible means of the cocoa industry in Nigeria for the benefit and prosperity of the producers," and as long ago as 1948 an approach was made to A. W. Ashby, Director of the Agricultural

Economics Research Institute at Oxford, to ask him to bring together a committee to initiate and supervise a comprehensive survey of the economy of the cocoa areas. Plans for the survey were approved by the committee in August 1950; a full field survey was conducted during the two years ending March 1953; a period of about fifteen months intensive office work in London on the field material was necessary before this book could be written.

The result is a formidable and remarkable work which, as it cost £70,000 and runs to some 350,000 words, 369 Tables and 33 Charts, must be judged by the most formidable standards. It is not primarily a work which sets out to answer any of the pseudo-political questions which, when world cocoa prices were high, so exercised international cocoa circles. It is true that the authors sought with diligence and punctiliousness to adhere to their absurdly comprehensive terms of reference (for which, presumably, the managing committee for the survey, which met in England, must take the main responsibility) and that one of these was the effect on the farmer's well-being " of the present system of marketing, which protects him absolutely from price fluctuations within a season and the more severe fluctuations from season to season." But although the main concern was the production of a " factual report " which would record in detail how the cocoa farmer and his family lived, worked and secured their livelihood, I think that throughout the work more attention should have been paid to readers' requirements. We all have our unanswered questions. The more I read the book, the less convinced do I become that certain of my more obvious questions have been adequately answered.

Let me give an example. The matter of new planting of cocoa is an important one. Now it so happens that the only mention of new cocoa farms in the terms of reference is in (*a*)—" Cost of the establishment and maintenance of his [the cocoa farmer's] farm." This may be why the book contains practically nothing on new farms—had the senior staff been more in the field, they would have been compelled to seek an amendment of their terms of reference. We learn (p. 360) that few farmers in the selected families had planted in recent years or were planting during the survey, and thus (p. 334) " the allocation of labour to immature cocoa plots is a complication we can ignore in discussing the farmers." In the Gold Coast most cocoa farmers in most areas appear to have non-bearing (young) cocoa farms. Can the two countries really be so different? Did any of the forms or questionnaires used by the field staff include questions on young farms? (Incidentally, the failure to publish any of these forms as Appendices to a book of this length seems a grave omission.)

The survey methods were both orthodox and unorthodox. They were orthodox in that it was the role of the junior unskilled staff to be in touch with the cocoa farmers and their families—the senior skilled staff being mainly concerned with " organisation " and with criticism and analysis of the results. The authors are very frank about their difficulties in securing

competent field staff. The failure of the five or six Research Superintendents "to meet the standards required had many unfortunate consequences. Not only was the standard of recording affected but a great strain was put on the Senior Officers and later on the office staff in dealing with imperfect records which could have been improved out of all knowledge if the Assistants had been properly instructed by their supervisors and their notebooks and records promptly and intelligently checked in the field." But despite this frankness, I think that the authors are still unaware of the extent to which the field staff stood as a barrier between their own critical intelligences and the comprehension of the activities of the farmer. Uneducated field-workers all over the world are liable to build up obstinacies, resistances, orthodoxies of their own, *which they tend to impart to one another*, and only the constant presence of the senior staff in the interviewing field can counteract these. Much is seen through a glass darkly. I do not agree with the assertion on p. xxix that "information obtained at single interviews or by inquiries for limited periods (even if these are repeated at intervals) will be fragmentary and probably most inaccurate." All depends on who collects the information. I think it is always necessary in Africa to complement the orthodox survey through field-workers with information obtained from the same informants in all kinds of informal ways. The authors were too busy with organisation to have time for this.

An unorthodoxy of approach, which I find commendable, was the bold decision to choose the families for study, not to draw them by random sample. While I do not agree that a justification for this was that there was a serious risk that most of the persons drawn from a list by random sampling would refuse to co-operate, I think that the need for an extensive geographical coverage, and the fact that there were no satisfactory lists from which a random sample could have been drawn, more than justified the approach adopted. But although a method involving a rough stratification by size of family and size of cocoa holding was adopted, I think the authors sometimes tend to forget that their material is not fully representative—partly for reasons beyond the authors' control the records of only 187 families were accepted and tabulated for the inquiries into production, consumption, income and expenditure.

The book is so capacious that it is hard to give a bird's-eye view of its scope. In Part I the chapter on Resources, for instance, is 101 pages long. That on the General Pattern of Consumption and Living is based on the detailed census of around 750 families carried out in 1950–51. Part II presents the results of the more intensive survey of specially selected families (187 of them) over a longer period. I cannot here comment adequately on it: it is impossible to know where to start. So much material—relating to factors of production, labour, production, income, indebtedness, consumption and expenditure—is presented. To criticise is, I know, to look a gift-horse in the mouth; for there has never been anything like it before. And then

the authors are themselves so critical of their figures and yet so persistent. I cannot make up my mind whether I am willing to accept the accuracy of figures which show the savings from cash (savings being the residual of receipts less expenditure) of all the families surveyed to be no less than two-fifths of their whole disposable income and not a great deal less than the household expenditure. It is true, as the authors emphasise, that cocoa farmers enjoyed an unusual increase of cash income in the 1951–52 season (as a result of the raising of the cocoa price from £120 to £170 a ton) and that the prices of commodities were stable or falling and were expected by some to fall farther so that there may have been a tendency to postpone expenditure; but can one really believe that any low standard of living community would be capable of such a degree of abstention?

Nevertheless, the impressive quality of much of the statistical material in this book ought greatly to encourage the academic study of the economics of tropical Africa. One cannot expect young students to be attracted to this fascinating field until there is raw material for them to get their teeth into. Although Mr. R. Galletti, the principal author, has analysed his figures with passionate devotion, the Appendices contain many tables demanding further analysis. One must agree that the work of the recorders in getting the facts of food consumption, yielded " remarkably consistent, coherent and probable " results. The sixty-five-page section called Labour and Land in Farming stands in its own right as a kind of Ph.D. Thesis. All in all, the authors are worthy of the magnificent format they have been given by the Oxford University Press. And I do not think the volume will date.

POLLY HILL

Accra.

Adam Smith and the Scotland of his Day. By C. R. FAY. Department of Social and Economic Research, Glasgow University, Social and Economic Studies III. (London: Cambridge University Press, 1956. Pp. 174. 25*s*.)

WHEN Mr. Fay knows a thing, no man knows more of it than he. In this comparatively short book we are given, not all there is to know about Adam Smith, not a criticism of his ideas nor an appraisal of his work as philosopher or economist, but a re-creation of his world and of himself. Not, oddly enough, very much of his material world; but abundantly of his intellectual and personal world, the world of his ideas and his friends. And it is not merely what passed in the Scotland of that day, as the title would suggest, which is brought before us; here is life in Oxford as well as Kirkaldy, London as well as Edinburgh. Mr. Fay is a master of detail, and his book is a mosaic of personalities, incidents, anecdotes, extracts from letters, snatches of conversation.

It seems a safe guess that everyone, however familiar with Smith and his age, will find here something that is new. In particular, Mr. Fay has

interesting things to say about the relations between Smith and some of his contemporaries. Besides the well-worn theme of the possible influence upon Smith of Turgot and Quesnay, there is a good deal that is new concerning Smith and his intellectual contacts with the lawyers Blackstone and Mansfield and the political theorist John Millar. It is, indeed, in establishing such points of contact and thus in " placing " Smith within his age that Mr. Fay is at his best. There are a few trifles to argue about. Some may disagree with what is said about Mandeville, and perhaps Cantillon and Turgot are done rather less than justice when it comes to listing Smith's " fundamental contributions " to economic thought. But these are matters more of opinion than of scholarship and fact.

The book contains no summing up, no considered view. The reader is left to form his own impression of the man and his works as a whole. There are a few fine, provocative asides—" In lauding nature and sterilizing trade the physiocrats ran amok with a bright idea " (p. 160)—but for the most part the actors and disputants are left to speak for themselves. Mr. Fay knows them all.

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War Economy, 1939–1942. By S. J. BUTLIN. Australia in the War of 1939–1945, Civil Series, Volume IV. (Canberra: Australian War Memorial (London: Angus & Robertson), 1955. Pp. xvii + 516. 25*s.*)

THIS is the first of two volumes in which Professor Butlin is presenting the history of the economic war effort of Australia. The present book takes the story to the eve of Pearl Harbour, that is to say, it stops at the point when, on his own assessment, the transition to a total war economy came to be made. Inevitably, therefore, this is the history, at best, of preparations only and of " mistakes and bickerings " at worst.

It is a most detailed account: so much so, that to the reader who is not himself quite closely acquainted with the events and personalities described and analysed, the book makes pretty hard reading in places. It is difficult to judge whether this could have been remedied without loss of valuable material by a more cursory treatment of certain features of these early gropings towards a true war economy. But one reader at least cannot help gaining the impression that Professor Butlin finds it difficult to resist the temptation to put in everything he knows. No doubt, the second volume will enable one to test this impression, since the picture of the subsequent three years will necessarily have to be painted on a broader canvas.

There can be no doubt, however, that Professor Butlin knows pretty well all there is to know of the period with which he deals; and while there can be few if any who could test his accuracy, both of facts and interpretation,

on every point, the overwhelming impression left is one of complete reliability in regard to the facts and sound judgment on the issues. Like the writers of the British civil histories, Professor Butlin has had full access to official papers, including Cabinet documents. But he has clearly relied on much more than official records and, in particular, must have derived much help from personal contact and interviews. Unlike the British authors, he deliberately sets out to be much more free in his assessment of the part played by individuals, particularly civil servants; and the book is greatly enlivened by the naming of names and the apportionment of credit and blame. On the whole, this novel treatment seems to be successful and makes one wonder whether it might not with advantage be tried some time (cautiously, no doubt, and perhaps with a suitable " quarantine " period!) in our official histories. Another experiment is the inclusion of a number of contemporary cartoons. These are less obviously a useful contribution, but some of them certainly illuminate a situation or problem more vividly than pages of writing or statistical tables.

As is inevitable in any work of this kind, chronology and clarity of exposition are in an uneasy compromise. Generally, however, Professor Butlin has been more successful than most in combining the straight historical narrative with treatment by topics. His plan is clear. After a brief introductory survey of pre-war planning leading up to the *Commonwealth War Book* (which one senior official said he had locked up when war came because " it was just b—— irrelevant "), he deals in eight chapters that occupy about two-thirds of the book with preparations up to the end of 1940 under these topics: price control, export industries, external finance and trade, shipping, public finance, labour, supply and production. This whole period of nearly eighteen months is then reviewed in an excellent brief chapter which makes most rewarding reading. Four more chapters take the story twelve months forward in respect of finance, transport and coal, overall economic balance and man-power. A final chapter analyses, in less than twenty pages, the economy on the eve of the Japanese attack and America's entry into the War and shows Professor Butlin to be capable not only of meticulous detail but also of broad and enlightening generalisation.

It is difficult to pick out examples from the very large number of interesting details in this narrative. Special mention may, however, be made of the committee of economists set up in December 1938 in the Defence Department, which as a corporate body does not seem to have been able to infuse greater relevance into the *War Book* (see, for example, the complete absence of any appreciation that civilian consumption would need to be deliberately curtailed), but whose members in various capacities contributed most notably to the management of Australia's war and post-war economy. Of great interest also, on a different level, is Professor Butlin's description of the progressive development of bulk-buying arrangements for Australia's main export commodities, his analysis of the slow development of sensible

war finance, and of the (not unusual) trials and errors by which an efficient organisation for war production was built up.

Special praise is due to Professor Butlin's frank yet quite unpartisan treatment of the change of government in October 1941, and the coincident major change in the central conception of the economy in war-time. This is well brought out in his chapter on " Labour's First Budget " and in his final survey of the economy at the end of 1941. His summing-up, which neither belittles the achievement by that time of an industrial base and an administrative machine nor understates the violence of the subsequent change to a total war economy, is balanced and convincing.

ERIC ROLL

London.

The Early History of the Russia Company, 1553–1603. By T. S. WILLAN. (Manchester: Manchester University Press, 1956. Pp. 295. 30*s.*)

To reconstruct the early history of the Russia Company is an immensely difficult task. Almost inevitably, any manuscript material which may exist in Russia cannot be investigated. More serious is the defective nature of the English sources. The early records kept by the Company itself were all unhappily destroyed in the Fire of London in 1666; and it is a nice comment on the inadequacy of the English material available to Dr. Willan when he observes that " the historian of Tudor trade cannot live by statistics alone unless he wishes to suffer from malnutrition." In the face of such difficulties Dr. Willan has done a first-rate piece of detective work. Making judicious use of the scattered evidence he has painstakingly unearthed, Dr. Willan has pieced together an excellently clear and detailed account of the early years of the Company.

Inevitably, much of the story of the Russia Company is closely linked with the diplomatic relations of England and Russia. The merchants, it is true, always hoped that " merchants' affairs " could be kept separate from " princes' affairs." But this was never feasible when the Company enjoyed a highly privileged position in Russia (for the most part it was, for example, exempted from customs duties) and when the Tsar expected these privileges to be paid for in " political coin." Thus Dr. Willan gives us an admirable account of Ivan IV's attempts to translate a commercial relationship into an offensive and defensive alliance. Elizabeth had skilfully to resist these without jeopardising the commercial concessions her merchants enjoyed—just as Walpole had to deal with a precisely similar situation in the 1730s.

The mixing of " merchants' affairs " with " princes' affairs " was not the only problem which the Russia Company had to face. Dishonest servants, interlopers, the natural hazards of the treacherous sea journey to St. Nicholas (the outward voyage took from one to two months, the return rather longer, and, since the port was ice-bound from autumn to spring, the ships could

make only one round trip a year, which had to be carefully timed), attacks by buccaneers, and the unpredictable behaviour of the Russians, were constant anxieties for those who ventured in the Muscovy trade. Indeed, so great and constant were the difficulties, that one cannot help wondering why the Russia trade was maintained at this time. Certainly it was hardly because the trade was vital to either country, though by the end of the century most useful amounts of cordage from Russia were being supplied to Elizabeth's Navy. Nor can the continuation of the trade be attributed to the size of the profits. As Dr. Willan shows, there were none at first, and after a number of years the Company had in effect to write off at least a proportion of its original capital. Even by the end of the sixteenth century, what rewards there were seem far from excessive when the degree of risk is borne in mind.

That the trade was nevertheless persevered with was undoubtedly due, in part at any rate, to the natural momentum to continue in operation which a joint-stock monopoly like the Russia Company generated. The monopoly was important because it held out hope for the future and therefore helped to make present losses the more bearable. The joint-stock principle was no less vital. As Dr. Willan shows, the main features of the Russia trade at this time were such that it is difficult to see how it could have been carried on on other than a joint-stock basis. And since at first the Company did not opt for a system of terminable stocks, this gave members a vested interest in the continuation of the trade, and thus contributed to the momentum which kept the Company going.

Dr. Willan's account leaves one in no doubt of the value of the services which an organisation like the Russia Company rendered in the development of English trade. We are fortunate, therefore, that Dr. Willan has been able to give us such a clear picture of the Company's trading organisation, both in England and in Russia, and that he has managed, in spite of all the obstacles, to give some idea of the extent of that trade.

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Peasants, Politics and Economic Change in Yugoslavia. By J. TOMASEVICH. (Stanford, California: Stanford University Press (London: Oxford University Press), 1955. Pp. 743. $7.50.)

THERE are very few reliable books in English to which the student of economic history can turn for information concerning agrarian, commercial and social developments in the Balkans. Dr. Jozo Tomasevich's massive study of *Peasants, Politics and Economic Change in Yugoslavia* should therefore be warmly welcomed by scholars in this country. Here, for the first time, is a detailed and objective survey of Yugoslavia's economic progress between the two World Wars, preceded by an outline account of the history of the Serbs,

Croats, Slovenes and Montenegrins who were united into a single political unit in 1918.

When Serbia expanded into Yugoslavia on the collapse of the Habsburg and Ottoman empires the country was in a deplorable condition. Casualties had been very heavy during the Balkan Wars and the First World War; the country had recently been occupied by enemy troops; farms had been neglected; transport was disorganised, local administration had collapsed, and there were dangers of racial and religious conflicts. Apart from these factors in the situation, the basic problem of " rural over-population " had to be faced. It appears that in Yugoslavia more people were trying to make a living on a given area of farm land than anywhere else in Europe. Dr. Tomasevich discusses the policy pursued by the Yugoslav Government in the period after 1918, and he examines the means by which the State tried to solve the fundamental problems raised by the continued growth of population in a predominantly rural country. This part of Dr. Tomasevich's book is an invaluable contribution to the literature of the subject.

The early chapters, on the period before 1918, are in some respects less satisfactory. Until the last quarter of the nineteenth century most of the regions which now form part of Yugoslavia had for centuries been under foreign rule. It is clearly difficult to survey the economic development of the lands of the southern Slavs when they formed part of the Ottoman, Habsburg and other dominions. The author might have achieved his purpose better if he had written an introduction on the economic conditions in the territories inhabited by the Southern Slavs in the period 1900–18 and left to historians of the Ottoman and Habsburg empires the task of describing the economic development of these regions in the nineteenth and earlier centuries.

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Pioneering in Big Business. History of the Standard Oil Company (New Jersey), 1882–1911. By R. W. and M. E. Hidy. (New York: Harper & Brothers, 1955. Pp. xix + 839. $7.50.)

One of the strongest arguments which has been used to persuade business firms to open their records to scholars is that only by so doing can they get " fair " treatment historically. Industrial history written from court records, government investigations and periodicals is almost bound to emphasise alleged violations of the law, economic and social ills and the sensational rather than the humdrum aspects of business history. By placing its existing records temporarily at the disposal of the Business History Foundation, Inc., Standard Oil of New Jersey has gained able, judicious and sympathetic writers to present its views of the controversial years 1882–1911 in the first of several promised volumes on the history of the company. Though they generally prefer the testimony of a Standard Oil leader,

Professor and Mrs. Hidy and their assistants have avoided the other pitfall of relying exclusively upon the company records for their history. While reviewing much familiar material, they amply justify this extensive addition to the voluminous literature on Standard Oil by illuminating many aspects of the aims and policies of Standard Oil as its leaders saw them at the time.

The book covers the history of the Standard Oil interests under three successive legal types of combination: the trust (1882–89); the "community of interest" (1889–99); and the holding company (1899–1911). These three periods form a somewhat artificial framework for topical treatment of each of the functions this group of firms performed. Production of crude oil, its transportation and storage, refining and manufacturing, domestic marketing and the varied foreign activities of the group are described in each period. Only labour policy and finance receive general treatment for the whole thirty years. The book is so written that any chapter can stand by itself as an account of the group's reactions to a given set of problems. This is a by-product of their approach to business history which is strongly influenced by the case-study method of N. S. B. Gras and Henrietta Larsen. The book is not primarily concerned with problems of economic growth. It aims to show how the leaders in this industry responded to particular "prods and pressures" in making business decisions. The authors applaud the company when it made the "right" decisions and point out where and when it went wrong. Some fascinating and gripping accounts of the "game" of business result, notably the story of "conquering Lima crude," the building of an integrated affiliate after oil was found in California and the unsuccessful attempt to become producers in Asia.

Competition in various forms, from other refiners and marketers hatched either by Standard Oil's efficient organisation of the oil industry or by new sources of supply, from alternative sources of light and fuel and even among components of the combination itself, is interpreted as an effective pressure upon Standard Oil to which its leaders responded by lowering costs in every phase of their operations. How much lower costs were reflected in prices is not clear. The writers are able to give only one example of the proportion of average savings in cost in processing a gallon of crude passed on to buyers between 1884 and 1885. With the exception of crude-oil purchases up to 1895, prices were always a matter of policy, though that intricate policy which varied from market to market receives no systematic treatment.

Perhaps the most important contribution of the volume is its analysis of the development of management techniques. In part because the authors had access to company records and did not depend on the private papers of individual leaders, a startlingly different picture of management methods emerges from that presented in Nevins' study of Rockefeller or, for that matter, in Wilson's of Unilever. The Hidys show how the individualistic leaders of an era of cut-throat competition came to work together in a large

combination, not through the domination of a single personality, but by the use of committees and consultation. Whereas in Professor Nevins' view Standard Oil did things because Rockefeller (or later Archbold) " ordered " or " had " them done, actually the leaders operated increasingly on the basis of information supplied from below, recommendations from committees with specialised functions, and face-to-face consultation and investigation. Decisions were the " synthesis of opinion of the group after discussion." The process was slow and bureaucratic, but it was an important part of holding the organisation together. Individualistic leaders in affiliates were given lots of head, and occasionally even the strict rules that appropriations over $5,000 and salaries over $600 be approved at 26 Broadway were allowed to lapse in the interests of harmony. This concern with harmony often delayed the rapid adoption by all affiliates of innovations made inside and outside the group. But though consultation was the key to management relations, the group patriarchally resisted its extension to the labour force.

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Measurement of Responsibility. By ELLIOTT JAQUES. (London: Tavistock Publications, 1956. Pp. xiii + 143. 15*s*.)

THE setting of salaries and wages is amongst the most crucial, and also the most embarrassing, problems in industry. Dr. Jaques looks at these social-economic problems from a fresh viewpoint. He was retained by the Glacier Metal Company as consulting social-analyst, responsible to the Works Council. Hard-hit by apparent inconsistencies in salaries, the Lowest-Grade Staff Committee sought his help to discover objective criteria for defining and measuring the responsibilities attaching to jobs; this led on to a study of the whole wage- and salary-structure of the firm. The author notes that the instruments used for *measuring* work derive directly from the particular method used for *describing* work.

At the outset, criteria such as number of subordinates, equipment controlled, amount of training or qualifications required, failed to give useful assessments of responsibility and authority; so did rating scales and similar quasi-objective methods traditionally used for job-evaluation. From the suggestion of a relation between the " size " of responsibility and the time over which it is carried before being checked, the author came to the concept of the maximum time-span of discretion attached to a job. The method of assessing this, by reaching agreement in discussion with the person doing the job, entailed, first, teasing out the discretionary content of the job; second, discovering the ways (often indirect and not obvious) whereby the use of discretion was reviewed by superiors; third, discovering the maximum period of time that would elapse before such review, during which the person was authorised and expected to exercise discretion on his own

account. Important ideas contrast the *prescribed* content of a job (laid down by rules, policies, physical limitations and the like) about which the person has no choice, and the *discretionary* content (such as choice of methods to achieve a prescribed result and—usually—rate of work); and point out the various methods of review—direct and indirect—used by superiors. People could also agree upon the salary which was fair for their job. Fair payment appeared to be specified completely by the level of work, defined by the maximum time-span of discretion; it was not necessary to refer to quantity of work, nor to the *prescribed* content of the job. With hourly-paid operators, this method was found to apply for those jobs carrying responsibility of more than a few days' span. In shorter-term jobs the measure of discretion was found in the maximum potential loss, *e.g.*, as scrap or damage, which bad judgement could cause; this, too, was found to be closely related to earnings.

These ideas are so interesting and stimulating that it is the more pity that the findings are out of the reach of scientific discussion. This is because the author nowhere describes the methods used to arrive at his quantitatively-expressed data (maximum time-span of discretion; maximum potential loss; salary considered fair) in such a way that another observer could repeat them to arrive at comparable figures. For instance, the " times to pay-off " of a series of decisions must form a statistical distribution; what point of this distribution (for instance, upper quartile or centile) did the author take as " the maximum time-span of discretion "? Statistical distribution is never mentioned, nor possible difficulties of definition, for example, of what is " prescribed " (perhaps by custom or habitual skill) and what is " discretionary." However, " all members were able [in discussion with the author] to describe their responsibility in terms of maximum time-span, and in a manner absolutely consistent with the independent assessment of their managers [in discussion with the author]. . . . There was no dubiety." The measurement of level of work in terms of time-span is repeatedly described as " objective "; the numerical assessments were apparently reached in discussion and (even though the assessor was medically qualified) this seems an unusual connotation of the term " objective ". The developments here reported, based on unrecognised subjective judgements, indeed offer an interesting parallel with the little-known history of *n*-rays in physics (described by G. F. Stradling in the *Journal of the Franklin Institute*, 1907). Again, some years ago the reviewer was encouraged by an exponent of another " scientific " method of measuring work to learn to do it himself: " You try doing it for a week, and then you'll suddenly realise that you can do it." Another criticism is that, before reaching wide conclusions, one would like to see the method repeated by more people and in more firms than Glacier.

The interest of the book, then, lies in the ideas it puts forward, rather than the findings. In industry, it seems, any attempt to measure work compels

close scrutiny of what really goes on; a main benefit is the resulting spring-clean. Likewise, this book is full of shrewd incidental observations. Clearly written and well printed, it should be read as a valuable stimulus to new thought in many directions.

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London.

Elections and Electors. Studies in democratic representation. By J. F. S. Ross. (London: Eyre & Spottiswoode, 1955. Pp. 480. 42*s*.)

HERE is an author with an unrivalled knowledge of his subject, sensible and interesting views on it and a message. The message is that the present method of consulting the electors in Great Britain is inadequate, out of date and incapable of rational justification. It is 1832 all over again. We need another Great Reform Bill.

There are two habits of the national mind which we need to be reformed out of. One is that the straight fight in a local township is the ideal expression of political rivalry. Mr. Ross finds this scarcely civilised. Indeed, in his view to think of politics in terms of fighting makes Red Indians of us—what will do to sell breakfast cereal will not do to interest us as voters. The other is that the single-member constituency, the smallest possible voting area that is to say, possesses natural political virtue. The traditional misconception that to turn the country into a map of constituencies like these gives the best chance to all parties, to local interests and to the voter himself, informed the *Representation of the People Act, 1949*, and still completely dominates our practice. It could not be more wrong. What we really need is much larger constituencies, and more members sitting for each of them: five is best, three or seven will do; one member per constituency is intolerable.

This book is readable and may well be influential—especially taken along with his two earlier works—because of the way Mr. Ross chooses to convince us of these palpable errors. He appeals to our principles and he floors us with figures. The two-party attitude and the accent on a straight fight between them with simple majority counting makes our system unrepresentative, and it insults the intelligence of the electorate. Mr. Ross believes that voters can make up their minds between candidates in other ways than by party labels alone, that they are capable of ranging three, five or seven in order of preference and that they are prepared to permit more complicated counting than the simple totting up of *x*s against one name or another.

It is possible that he is right in these claims. But the two-party system would need to justify itself on general grounds if these accidental aids to its persistence were removed, and it is to be hoped that the British electorate would accept it by intelligent choice. For persuasive and moderate as he is for a man with such an excellent case on such a subject, Mr. Ross's political assumptions are unsophisticated. No political theorist, however willing to accept the correction he is given here for misunderstanding methods

of representation, could ever think of representation as he does. The process of exploiting, manipulating, even falsifying the representative system is part of politics itself, one of the complicated consent mechanisms which make government possible. The straight fight mentality is a great psychological strength to British democracy, and not because it is just another Test Match or Cup Tie for the supposedly ignorant and stupid. It is the guarantee of an open game.

When he brings forward his figures, however, Mr. Ross says some very interesting and important things. He demonstrates quite convincingly that the single-seat system can never provide equality of electorates. He is devastating on our persistent attempt to make constituencies " natural," representative of historical and geographical divisions. The great strength of his multi-member constituencies, it seems to me, is that it would turn the conurbation, the nearest thing to a natural community we seem to have left to us, into the geographical basis of politics. If we could adopt this, we might really be carrying out the ideals of 1832. But meantime it is fascinating to wonder how much of the marginal constituency and other talk of our " psephologists " merely arises because of the incredible inconsistencies which this book shows up.

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NOTES AND MEMORANDA

A FORMAL PROOF OF THE CONCAVITY OF THE PRODUCTION POSSIBILITY FUNCTION [1]

1. It is a generally accepted feature of economic models of an economy which can produce only two commodities that the production possibility function will be concave, *i.e.*, that the two commodities will be capable of being produced only at increasing opportunity costs in terms of each other, if constant returns to scale prevail in the production of both, but the most economic way of producing them involves the use of differing factor proportions. It is true that this appears to be obvious; but it is of some interest to know that it can be proved geometrically in a simple manner, shown below.

2. In the figure [2] the axes represent the total supplies of factors (*a*) and (*b*), and $HABC\mathcal{J}$ represents the locus of all equilibrium combinations of factors in the production of goods (1) and (2); *e.g.*, at *B*, the parts of factor (*a*) to the left of *B* are used in the production of good (1), and the parts to the right of *B* are used in the production of good (2); and the parts of factor (*b*) below *B* are used in the production of good (1) and the parts above *B* in the production of good (2). An equilibrium point is, of course, one at which the relative marginal products of the two factors are the same in each occupation; this means that at any point on $HABC\mathcal{J}$ the iso-product curves of the two commodities, *i.e.*, the curves showing the various combinations of factors which could produce equal amounts of each product, are tangential. In the figure, *aAa*, *bBb* and *cCc* are iso-product curves of good (1), and *a'Aa'*, *b'Bb'* and *c'Cc'* are the iso-product curves of good (2).

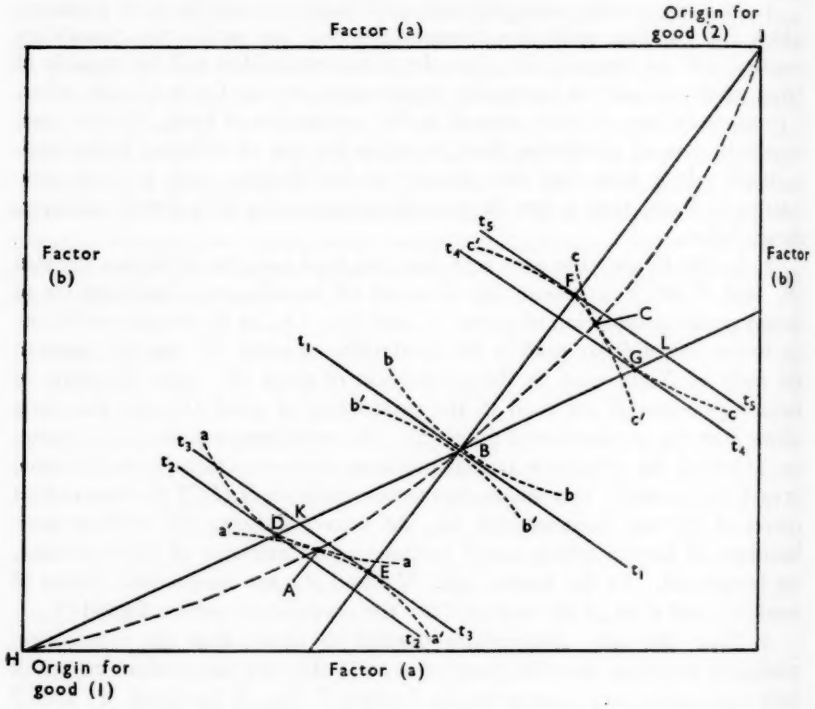
3. Now the only assumptions needed to prove that the production possibility function must be concave are (1) that the iso-product curves of each commodity are convex to the "origin" (*i.e.*, *H* for good (1) and $\mathcal{J}$ for good (2)); this means that each good has a production function such that to produce the same output with varying factor proportions, either factor needs to be increased more for each successive decrease of the other: and (2) that the production functions of each good are "linear homogeneous," *i.e.*, that constant returns to scale prevail with any given factor-combination.

4. If these assumptions are made, then let *A*, *B* and *C* be points which

[1] This note was written while the author was a Student of Nuffield College, Oxford, and Senior Webb-Medley Scholar.

[2] The diagram is that originated by W. P. Stolper and P. A. Samuelson in "Protection and Real Wages," *The Review of Economic Studies*, Vol. IX, November 1941, reprinted in *Readings in the Theory of International Trade* (Allen and Unwin, 1950), pp. 333–57.

involve equal increments of good (1) in the movement from A to B and from B to C. D and G are points which represent outputs of good (1) equal to those at A and C, but factor proportions equal to those at B; while E and F are points which represent outputs of good (2) equal to those at A and C, but factor combinations in the production of good (2) equal to those at B. t_1Bt_1 is the common tangent to bBb and $b'Bb'$ at B. t_2Dt_2, t_3Et_3, t_4Gt_4 and t_5Ft_5 are the tangents to aAa, $a'Aa'$, cCc and $c'Cc'$, at D, E, G and F



respectively. These must all be parallel to t_1Bt_1, because of the "linear homogeneous" properties of the iso-product curves. As $aDAa$ is convex to H, A lies between t_2Dt_2 and B.

As $a'AEa'$ is convex to J, t_3Et_3 lies between A and B.
Thus K, where t_3Et_3 cuts $HDBG$, lies between D and B, and $BK < BD$.

As $cGCc$ is convex to H, t_4Gt_4 lies between C and B.
As $c'FCc'$ is convex to J, C lies between t_5Ft_5 and B.

Thus L, where t_5Ft_5 cuts $HKBG$ produced, lies beyond G, and $BL > BG$.
Thus as $BK < BD$ and $BD = BG$ and $BG < BL$, $BK < BL$; but BKE and BLF are similar triangles, so that $BE < BF$.

But production of good (2) is the same at E as at A, and the same at F as at C. Therefore the decrease in the output of good (2) incurred in a movement from A to B is less than the decrease incurred in a movement from B to C; *i.e.*, equal increments of good (1) can be obtained only at the cost of increasing decrements of good (2), provided that both goods are produced under conditions of constant returns to scale with any given factor-proportions, that the iso-product curves of each are convex to their respective origins and that the equilibrium methods of production of some of both goods involve the use of factors in different proportions in the two industries.

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THE DEFINITION OF SOCIALISM: A COMMENT

THE really essential element in most of the traditional definitions of socialism put forward during the last hundred years has been the public ownership of the material instruments of production. Certainly, at any rate, most of the economists who have discussed socialism in recent years—Mises, Pigou and Lange, for example—have assumed that this was the position. Mr. H. Smith, however, in his article in the September 1955 issue of the ECONOMIC JOURNAL, suggests that socialism should be re-defined to mean a society in which all forms of economic conflict, and therefore all forms of undue group advantage, have disappeared. Socialism in this sense, Mr. Smith argues, is compatible (at least in theory) with either the public or the private ownership of the instruments of production, and there is no real reason to suppose that public ownership will be any more likely than private ownership actually to bring it about.

What Mr. Smith appears to be saying, at least by implication, is that the public ownership of the instruments of production was advocated by socialists merely as a means to the end of a society without classes. Now if we define " classes," as Mr. Smith proceeds to do, as " groups within which movement is difficult, possessing different incomes and preserving the differential by the combined exercise of economic and political power," it can plausibly be argued that the mere public ownership of the instruments of production will not necessarily bring about a society without " classes " *in this sense of the word.* For " classes," Mr. Smith says, are the product of " economic conflict "; and other types of " economic conflict " exist besides that which socialists have traditionally associated with an economy where the instruments of production are privately owned and " a high proportion of income consists of rents or quasi-rents." " Economic conflict " exists and breeds " classes " not only under these conditions, but also, according to Mr. Smith, " whenever capital is being accumulated faster than would result from the sum of private decisions to save with an approximately

equal distribution of the social income . . . or whenever, the marginal products of land and capital being significantly greater than zero, administrative decisions about the distribution of these factors have to be taken, with the inevitable results upon the products, social costs and incomes of the industrial groups involved." These latter conditions for the existence of economic conflict, and therefore for the emergence of " classes " in Mr. Smith's sense, are necessarily present in *any* form of society in which " the marginal productivity of capital and, probably, of land, is much greater than zero." Thus to develop a truly " socialist " society, in which economic conflict would be avoided or minimised and " classes " abolished, those in control of economic affairs must " above all things, aim at reducing the marginal product of capital as near to zero as may be." This would involve not simply the accumulation of capital, but also (since " the inventors will always outstrip the savers ") the deliberate suppression of all those new inventions which " at once created new tastes and the means of satisfying them." The basic conditions for the establishment of a stable " socialist " society, then, turn out to be that " tastes should be simple and conservative," and that " the level of industrial skill and the degree of capitalisation of industry should both be high."

The rationale of Mr. Smith's re-definition of socialism may still not be clear from this summary of his argument—and, indeed, it is by no means clearly stated in the article itself. The basic point seems to me to be the following: When socialists have suggested that the abolition of the private ownership of the instruments of production would lead to a society without " economic conflict " and without " classes," they have usually had in mind a particular type of economic conflict and a particular type of class relationship. The economic conflict they wished to abolish, broadly speaking, was that which arose in a capitalist society over the distribution of the national income between property-owners and wage-earners; and the class relationship they wished to abolish was that existing under capitalism between these two social groups. The question of whether any other types of economic conflict and undue group advantage would remain or emerge under socialism was frequently (but by no means always) neglected or soft-pedalled. What Mr. Smith is really trying to say, I think, is that this question should now be brought forward for serious discussion, since in his opinion experience has shown that the existence of a positive marginal productivity of capital, in *any* form of society, leads to certain types of " economic conflict " which are at least comparable in their power to generate cases of undue group advantage with that other type of " economic conflict " which socialists have traditionally emphasised. Mr. Smith's extension of the traditional definition of " class," then, and his amendment of the traditional definition of " socialism," are really only devices for drawing attention to the importance of these additional types of " economic conflict," and for emphasising his view that there is no reason to suppose that the abolition of the private ownership of the instruments of production would significantly reduce their intensity. If Mr. Smith's argument is interpreted

in this way, the rather misty air of paradox which pervades the greater part of it begins to disappear.

But even if we agree with Mr. Smith that the economic conflicts associated with a positive marginal productivity of capital are important, and that the abolition of the private ownership of the instruments of production would not significantly reduce their intensity, it by no means follows that it is either necessary or useful to re-define socialism in the way he suggests. Like Keynes' re-definition of " classical economics," which was put forward for a rather similar sort of pedagogic purpose, Mr. Smith's re-definition of socialism seems much more likely to sow confusion than to shed light on the problems involved. Suppose we have two societies—the U.S.S.R. and Britain, say—in both of which the marginal productivity of capital is greater than zero, but in the first of which public ownership of the instruments of production predominates, and in the second of which private ownership predominates. Even if both these societies be equally subject to certain types of economic conflict arising out of the positive marginal productivity of capital, it surely remains true that only the second is subject to that other very important type of economic conflict which is associated with the private ownership of the instruments of production and the consequent presence of a high proportion of " rents or quasi-rents " in the national income. It is this distinction between the two societies that the word " socialism " has traditionally been used to emphasise, and even if we accept Mr. Smith's main argument there seems to be no good reason why the word should not continue to be used for the same purpose. Even if it were true that new " classes " in Mr. Smith's somewhat puristic sense of the word were emerging in the first society, and that social legislation was mitigating the effects of conflicts between property-owners and wage-earners in the second, this would at most diminish the importance of this distinction between the two societies, and would by no means do away with it. Why should Mr. Smith not attach to his ideal society some harmless and handy label such as " Bliss " or " Modified Rapture " ?

But can we in fact accept Mr. Smith's main argument ? In particular, can we really accept his view that in *any* society in which the marginal productivity of capital is greater than zero and tastes are not conservative, wealth and power are bound to become concentrated in the hands of social groups which will use their position to obtain undue advantages ? This is a difficult question, which cannot be answered quite as readily as Mr. Smith seems to assume, and to which economists and sociologists ought to pay much more attention than they are doing at the moment.

The vital problem here seems to be that of the extent to which *social* control of economic and administrative decisions can become effective in breaking down " classes " in Mr. Smith's sense. *A priori*, one would surely expect that it would be more likely to be effective in an economy where the instruments of production were publicly owned than in one where they were privately owned. For in the latter type of economy, private ownership means that individuals take economic decisions and exercise economic

power because of the concentration of wealth in their hands. The structure of economic decisions in general is such that social control, while it may exercise *some* influence over the property-owning groups, is likely to be very limited in its power to break down " classes." In the former type of economy, on the other hand, one would expect that with the abolition of the power of the property-owning groups the possibilities of exercising social control over decisions would become much greater.

However, it is, of course, possible that in an economy where the instruments of production are publicly owned decision-making groups with power and virtual control of wealth (even though they do not legally own it) may emerge, just as they do in large monopolies under private capitalism. How far could social control become effective in breaking down the power of these new " classes " ? This is a question upon which the experience of the U.S.S.R., if properly studied, could in all probability throw considerable light. Some of the points which require empirical investigation are the following: What is the precise part played by " the public " in government and planning in the U.S.S.R.? How far is the extent of " public " participation in these activities likely to be increased by the recent measures of decentralisation ? How far will the introduction of universal compulsory secondary education, now rapidly proceeding, operate to prevent the emergence of a new technocratic " class " ? Is mobility between social groups increasing or decreasing, and how are the long-term policy proposals now being put forward likely to affect it in the future ? What is the significance of the recent public complaints about the excessively high incomes of certain groups ? What is the role played by the intense public criticism of bureaucracy ? An investigation of such points as these would probably show that Mr. Smith's argument, in so far as it purports to be derived from Soviet experience, is grossly over-simplified.

Finally, it is worth noting that in a society like the U.S.S.R., where the instruments of production are publicly owned, economic development is likely to be *more rapid* than in a society where these instruments are privately owned, owing to the fact that economic decisions are co-ordinated to a very much higher degree. An investigation of the effects of this rapid expansion might well confirm the Soviet claim that in the U.S.S.R., under conditions where the technical level of the population as a whole is being appreciably raised, the basis is now being laid for a wide diffusion of wealth and power among the people,[1] leading ultimately to a communist society in which (following classical Marxian theory) the present system of distribution according to work will be replaced by a system of distribution according to need. This is a point which cannot be ignored when dealing with the

[1] A new stage in the laying of this basis, as it seems to me, was reached at the 20th Congress of the Soviet Communist Party, which took place after the present comment was written. The investigation for which I am calling would require to consider carefully a number of the new policies announced at the Congress, notably (*a*) the abolition of school and university fees, (*b*) further measures of industrial and agricultural decentralisation, (*c*) a more equalitarian pension system, and (*d*) the reduction of the excessive gap between the wages of lower-paid and higher-paid workers.

problem. And Mr. Smith himself does give passing attention to it, in a footnote dealing with the capacity for rapid improvement in the standard of living in the U.S.S.R. " The rate of progress by internal standards," he says, " might easily become so great as to lessen or indeed abolish the conflict of interest if a substantial proportion of the resources now devoted to defence could be diverted." If Mr. Smith's qualifications here are relaxed a little, then this point alone—quite apart from those discussed above—would seem to be decisive against his proposed re-definition of socialism.

RONALD L. MEEK

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THE DEFINITION OF SOCIALISM: A REJOINDER

MR. MEEK is less in disagreement with me than he supposes. In his opening paragraph he quotes me as arguing that " Socialism . . . a society in which all forms of economic conflict, and therefore all forms of undue group advantage, have disappeared . . . is compatible with either the public or the private ownership of the instruments of production." This is a complete misunderstanding: my argument that a socialist society would be possible only when the marginal efficiency of capital was in the vicinity of zero (which is no more than a restatement of the thesis of Marx and Engels in more precise economic terminology) completely rules out its private ownership. " Private ownership " of capital which yields no revenue is nonsense as a general basis for economic life.

There are two points in Mr. Meek's criticism of my article which need a serious reply. The first is that a redefinition of socialism is unnecessary and confusing. The second is that a careful study of the U.S.S.R. should reveal more exactly the nature of the economic conflicts which survive in a collectivist economy and the prospects of their removal. With the second I am in most complete agreement. But to undertake such an investigation, even if the relevant data were available, one needs to know what to look for. My article attempted to commence the definition of the suitable terms. I cannot avoid pointing out that Mr. Meek seems to find my definition, as far as it goes, very useful in his last paragraph, although I cannot understand why he proposes to discard a definition of socialism by means of which the rapid development of the U.S.S.R. towards a socialist society can, as he considers, be demonstrated so triumphantly.

Concerning the first point, however, we are in flat disagreement. The traditional definition of socialism has been the public ownership of the means of production. I was not the first to suggest that it was inadequate. It is hardly necessary for me to point out that a very large number of prominent socialists now disclaim this definition in the light of both British and Soviet experience: one could fill a page with references to statements by economists like Lewis and Jay and Durbin, or to official pronouncements by socialist

parties in Europe. Unfortunately there is no agreement upon the economic arrangements which the critics of free enterprise wish to substitute for it, nor upon any standards by reference to which the extent to which extensions of public ownership fall short of " Socialism " can, in economic terms, be measured. (I am not concerned with *political* criticisms of experiments in wholesale or partial state ownership of industry, except to say that if " democracy " is to be allied with public ownership to produce socialism the democratic voters must have some idea of what to vote for if democracy is to produce the desired result.) In the economic field, I have tried to produce a formula.

The argument may be rephrased. It is possible fairly easily to define conditions in which there *need* be no conflict in economic life. Most people would do a little work of some kind rather than be completely idle: all can work more easily the more and better the tools and the greater the mechanical power at their command. There need be no economic conflict in a world in which the marginal disutility of labour and the marginal efficiency of capital are both zero. The idea of no one having to work beyond the point at which effort is more irksome than idleness is simple enough; it involves, however, the necessity of his being able to earn *all* that he wants by that amount of labour, leaving no desire unsatisfied. That is where the importance of the second condition becomes clear. If in every trade all those tools and mechanical aids are available in which the labour saved exceeds, to however infinitesimal a degree, the labour tied up in the device, then human labour is lightened to the greatest degree compatible with the development of applied science at the time. If there is no scarcity of tools, then no problem of their distribution between one industry and another exists, and the task of keeping labour down to the " voluntary " level is lightened. Short of this point, economic conflict is inevitable, whether the state or private persons own the scarce land and capital and organise production.

A great deal of what is written about the economics of socialism is circular in argument. Two excellent examples, both models of lucidity and sound economic reasoning, are Pigou's *Socialism versus Capitalism* and Lerner's *Economics of Control*. The former defines socialism as the ownership of the greater part of the means of production by the state and their operation without the accumulation of profit (not, as he is careful to point out, with any necessary lessening " of the range over which the desire for personal pecuniary gain governs conduct.") The *fact* of profit being eliminated, while individuals and groups still in all other ways open to them " compete " for the share of the national output which they receive, opens the way to a general consideration of the " maximisation " problem, and to the reaffirmation of all those points concerning the desirability and the difficulty of controlling monopolist pressures, aligning private and social costs and products, and equalising real income without destroying incentive which

are familiar to all readers of the Cambridge classics. Lerner starts out with the problem of real income maximisation, defines socialism as the state ownership of capital and land and proves that the formal conditions of maximising real income *need* not involve socialism as defined. Both leave us with minimised areas of economic conflict, and are centred on the problem of conflict; there is therefore an almost complete certainty that they would leave the common man (or the common socialist) saying, " This is not socialism." There is no reason why the protest " This is not socialism " should have any meaning sufficiently precise to be capable of analysis. In so far as socialism is an emotional concept it can be used to cover a very wide range of incompatible discontents.

A collectivist society *may* achieve a standard of living higher than that of any alternative one, given the techniques and resources at its disposal. But, for all that economic analysis can tell us, Professor Lerner's " controlled economy " could do this just as well. All this abstracts from the problem of administrative efficiency: it may well be that a free-enterprise economy, stiffened by strategically placed and unpredatory monopolies and guided by a wisely directed central bank, would do better for artisans and clerks than would the collectivist economy for the general standard of its more equal citizens. It would seem that there is no " economics of socialism " in the sense of formulæ for the arrangement of economic life which would remove economic conflict while work is still irksome and tools still limited. Socialism is an economic concept, but it is one which is only partly capable of definition by reference to the ownership of the means of production.

As far ahead as we can see in Britain and similarly situated countries the practical problem is to accept and strive to mitigate the conflict inevitable in a society which runs because of the spur of permanently unsatisfied economic wants, relying for its motive power on making the worker, as consumer, want an unattainable standard of living so badly that he will work hard enough to maintain and improve his existing one. Whether the exhortation is in the hands of commercial advertising or of the state does not matter much. (It is an education in the unity of economic problems to drive across the two sectors of Berlin, from the ostentation of the Stalinallee and the nagging of the posters in the Communist sector to the blare of commercial publicity in the Western sector.)

The two halves of the world economy are both going the same way; the one technically more backward, paying lip service to socialism, without any tradition of political democracy, and handicapped by clumsy and obsolete techniques of economic analysis: the other richer, chiefly democratic in structure, nominally profit-motivated, aided both in organisation and projects for reform by a more efficient economic technique. The former depends on state initiative, hampered by the conservatism of its people and the reluctance of its peasantry to accept collectivism; the latter depends on the initiative of groups of persons in control of privately owned capital,

countered by the power of organised labour, with the state alternatively responding to the pushes of pressure groups on either side. All the machinery which the economists have designed for the mitigation of this struggle is available, and will no doubt be increasingly utilised, but the criterion of "socialism" as a practical critique of political life has probably become meaningless.

That is why the traditional definition of socialism is inadequate. Far be it from me to underestimate the virtues of ambiguity in the terminology of politics: the administrator and the reformer must have elbow-room in which to manœuvre. But when a term, which commences by being a simple economic formula by means of which both the material standard of living of the masses is to be raised and social harmony is to be achieved, has come to be used to cover a wide range of proposals for social reform based, for the most part, upon some compromise between these two objectives, now recognised in some circumstances to be in opposition, ambiguity has gone too far. The paradox is not in my argument; it is in the situation which I analyse. The mist, if present at all, is on Mr. Meek's spectacles.

H. Smith

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AN ACADEMY OF ECONOMICS

One of the difficulties of economics lies in the failure of the science to adhere to a strictly defined technical vocabulary. Different authors frequently coin or use new terms for concepts already known under other names. And even the same authors often use different terms for identical concepts for the sake of stylistic variation.

This does not mean that different terms should not be used for similar and, perhaps, even identical concepts. For different expressions often illuminate at an instant aspects which other terms may bring to the surface only through laborious definition. There is room for synonyms everywhere. Nor does it mean that the same term should not be used for different concepts. This may bring analogous and homologous relationships to light which otherwise might remain hidden. But in each such case it would seem imperative to state at the outset all necessary cross references and to explain why a specific term has been selected in preference to related terms.

But how can this be done in view of the constant influx of new terms coined every year by an increasing number of economic authors pursuing similar studies in the most distant corners of the globe? The answer seems to be a sort of international exchange, an Academy, which would do for economics what the French Academy does for the French language. It would study the terms proposed, officially adopt those to be used, define them authoritatively, state their intellectual origin and compile them in a

definitive dictionary. Similar to the work of the French Encyclopædists, this would not only provide an indispensable guide to terminology and the history of economic thought; it would, moreover, avert the principal danger to every linguistic discipline—the annihilation of a language through the undiscriminating absorption of an excessive number of words and its ultimate strangulation under the impact of its own slang.

The membership of such an Academy of Economics should be restricted to perhaps forty or fifty persons chosen from amongst the world's most outstanding economists. A dozen or so might be elected to lifetime chairs named after eminent economists of the past, the rest to tenure up to retirement age. Election to membership would confer the supreme honour of the profession.

New terms, concepts and formulations, emerging as a result of new developments and studies, could then be submitted, defended and argued in special Academy lectures, with the Academicians, in due course, pronouncing their verdict as to acceptance and inclusion in the official dictionary. Old terms would be re-examined upon request, and supplanted by better ones if new findings should justify such a change. And particularly significant contributions might be honoured by the use of the author's name as part of a concept's official designation. Economics has already done this in some instances such as Gresham's Law, Pareto's Law of Income Distribution, the Malthusian Doctrine or the Pigou Effect. But many others could be added, such as Gossen's Curve (illustrating diminishing utility), Tugwell's Theory of Consumer Disadvantage (justifying in certain cases public control of rates and services of private enterprises), the Zaharoff Exemption (after Sir Basil Zaharoff's remark that arms are the only commodity defying the law of diminishing utility: the more one has of them, the more one wants to have more), Murad's Law of Diminishing Net Investments and many others. Besides the implication of professional recognition, such designations would contribute greatly to economic literacy, providing a briefing in theory and, at the same time, the history of economic thought. Appealing, moreover, to man's delight in gossip, the presentation of concepts and formulations against the background of the person and work of their originators would enhance familiarity with, and interest in, the subject still further.

An Economic Academy would thus serve not only one but several purposes. It would, above all, provide an invaluable incentive to precision, linguistic elegance and scholarship. It would infuse academic discipline into a field whose spread, practical importance and swift change make it increasingly unsurveyable. It would furnish a universally applicable dictionary, fulfilling for economics the function Latin fulfils for the Catholic Church. But, in addition, in the absence of a Nobel Prize for contributions to the social sciences, it would represent a device for giving proper honour to outstanding economists. And, by personalising a number of significant

terms through the inclusion of their authors as part of the official designation, it would, in an increasingly collectivised and anonymous age, restore emphasis to the importance of individual accomplishment.

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CANADIAN WHEAT GROWERS AND PRICE CHANGES

IN the ECONOMIC JOURNAL, June 1956, Miss Farnsworth and Mr. Jones cited an article of mine in their attack on beliefs that wheat farmers respond perversely to price changes. It must suffice here to make a brief comment.

Briefly, I agree with their general conclusion that in the *aggregate* wheat farmers behave orthodoxly in the face of price changes. My *Farm Economist* article never claimed to show any more than its own limited objective. My conclusion was neither generalised over time or place. Moreover, especially in the light of their own analysis, it is most surprising that they make no clear reference to the sixth stage of my analysis, which was to allow for the substitution effect as the price of wheat varied relatively to the prices of other field crops. This stage of the analysis was described in detail, and a long footnote set out the various alternative ways, which I had tried and rejected, of testing my hypotheses.

Miss Farnsworth's and Mr. Jones' main criticism concerning the original wheat-acreage statistics is in principle clearly justified. (Put not thy faith in Central Bureaux of Statistics!) However, at a later date I hope to show that by various adjustments it can be effectively met. Indeed, if one applies the corrections which they suggest in their Chart 1b to their Chart 1a it can be seen that their point is by no means fundamental.

During the period 1916–40 wheat acreages frequently varied without any compensating adjustment in the acreages under other field crops. Moreover, from the point of view of the wheat market it is the *absolute* variations in wheat acreages which are predominantly important. It is insufficient to consider only the substitution effect of a change in the price of wheat relative to the price of other field crops. This is my fundamental objection to Miss Farnsworth's and Mr. Jones' article.

Accordingly, it is not surprising that by reading off from their Chart 4a I calculate that their analysis yields an index of correlation of 0·06, whereas my original work provided one of 0·40. Partly as a result of their stimulus, I have re-worked my analysis so as to allow the relationship between wheat acreages and the real prices of wheat to become completely S-shaped. I will set out the theoretical justification for this in due course. The recalculated relationships yield an index of correlation of 0·62 and, if allowance is made for a time factor, of 0·68.

GEORGE ALLEN

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SEQUENCE ANALYSIS AND THE THEORY OF THE RATE OF INTEREST—A REJOINDER

THERE is no objection to Professor Tew's criticism [1] of my model that it tells two stories about hoarding. I can seen no reason, however, why an economic model should not tell two stories about the same thing. In fact, if one examines the stationary lagless model of the Keynesian system [2] one finds, to use Professor Tew's terminology, that the first equation—$i = L(Y,M)$—and the next three equations together—$K = k(i)$, $S = s(Y)$ and $S = K$—tell the same story, since the sum of the marginal propensities to save and to consume equals unity. Nobody, as far as I am aware, has taken exception to this system on such grounds.

Now it is the stationary nature of this (Keynesian) system which permits a proper solution. When, however, a lag is introduced and this stationary nature is not assumed, then the sum of the marginal propensities to supply investible funds and to consume is not *identically* unity. This, as I have tried to show,[3] necessitates the introduction of an additional *independent* equation. It is my refusal to assume that the sum of these two propensities is unity (and here Professor Tew agrees with me [4]) that creates the problem.

I am firmly convinced that there is a problem, although I am not overconfident in my solution of it. However, I cannot accept Professor Tew's solution of dropping the equation which brings the money factor into the system. Such a course implies that

(i) money has a part to play in a stationary system, and
(ii) it has no part to play in a dynamic system.

This conclusion is unacceptable, since Professor Tew offers no explanation to justify the existence of such a state of affairs.

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THE NEW ECONOMICS CURRICULUM IN THE FRENCH *FACULTÉS DE DROIT*

IT is generally known that in France economics has for the past three-quarters of a century been taught in the *Facultés de Droit* as a supplement to legal studies. Certain changes, it is true, have been slowly introduced from above. At the turn of this century there was established the *Agrégation des Sciences économiques*, a very difficult competitive examination for mature scholars, designed to select the future professors of economics. Since

[1] B. Tew, "Sequence Analysis and the Theory of the Rate of Interest," ECONOMIC JOURNAL, LXVI, 1956, pp. 533–5.
[2] See A. Ll. Wright, "Sequence Analysis and the Theory of the Rate of Interest," ECONOMIC JOURNAL, LXV, 1955, p. 626.
[3] See *ibid.*, p. 628.
[4] See B. Tew, *loc. cit.*, p. 534.

then, this *Agrégation*—whose level is well above that of the doctor's degree—has supplied the *Facultés* with about half a dozen economists of the highest grade every two years. In total, there are some sixty to seventy such professors of economics, mostly engaged in teaching, but often performing in addition other services (writing, government advising, research). Professors of international repute, such as the late Professors Nogaro, Pirou and Rist, and Professors Baudin, Perroux, James, Guitton, among those still teaching, were the products of this *Agrégation*.

A second change, first introduced in 1925 and further developed after the liberation, has provided for a special doctor's degree in economics. As it is organised now, the curriculum for this—beyond the *licence* level—consists of two examinations and a thesis, and requires about three years. The programmes, which have a common basis but many different features from one *Faculté* to the next and from year to year, are fairly wide and certainly as sophisticated as a curriculum for graduates in Chicago, Harvard, London or Cambridge. In recent years the annual output of doctors in economics has been fluctuating between one hundred and two hundred. They usually find jobs in government and international bureaux, in public corporations or in big private firms. Even though business heads of the older generation are not prone to hire economists and to use their services, there has hitherto been no shortage of jobs for our doctors.

Since November 1955 a much more significant reform of the *Facultés de Droit* has been put into actual operation at the level of the *licence*. Its main features are these:

(*a*) The lengthening of the curriculum from three to four years, in order to abolish the supposedly " easy-going manner " of the *Facultés de Droit* and to discourage, from the start, the amateurs; in the first year, this objective was attained, at least in Paris, where the number of registrations fell by 50%.

(*b*) Specialisation into three " sections " (private law, political science and economics); but every student must attend some courses, particularly during the first two years, in fields other than the chosen one; to use the American expression, a student who " majors " in economics must do some private law and some political science (see the Appendix).

(*c*) Extension of the seminar system, with relatively small discussion groups, in place of the purely formal *ex cathedra* teaching; for instance, in the *Faculté* of Paris, it has been necessary to recruit some forty instructors, each to take charge of one group; in the smaller provincial universities the professor, with the help of an assistant or two, is usually able to supervise directly the work of all his students.

The new system will certainly provide students with a first-class knowledge and understanding of economics, probably superior to that of the

present doctors in economics, except that they will not have had the special training that comes from writing a thesis on a narrow subject. This, incidentally, will render obsolete the present doctors' curriculum and make necessary a further reform, now under consideration.

In addition to economics, the *Licenciés de sciences économiques* will have a fairly wide knowledge of law, government, administration and the like. They will, therefore, be well prepared for an inter-disciplinary approach to their problems. Yet one may ask whether it is really advisable to substitute a couple of semesters of private law and legal history for such subjects as accounting, mathematics, sociology, psychology, business management and similar studies.

Argument continues as to whether it has been wise to extend the share of economics within the *Facultés de Droit*, or whether it would not have been better to organise two or three specialised *Facultés des Sciences économiques*, or whether again it would not have been still better to create a couple of *Facultés des Sciencies sociales*, more or less along the lines of the London School of Economics and Political Science and of the Oxford Faculty of Social Studies. I think I myself would favour this last solution, provided that teaching were not too fragmented.

It takes a long time before changes in curricula produce their full effect. We can, however, safely predict that around 1970, *rebus sic stantibus*, there will be over five thousand economists. To provide them with jobs, top administrators and business-men will have to recognise that an economist can be useful and is worth the money he gets.

One difficulty is that, for lack of an adequate supply of properly trained economists when they were needed, all sorts of pseudo-economists have been parachuted into our field: industrial advisers, financial counsellors, organisation " engineers," glorified accountants, management experts and even " *counseillers de synthèse.*" Furthermore, every *Faculté* is now launching a school of business administration, whose students will compete with our future *licenciés*. But if, as I hope, the same actual persons become both *licenciés* and graduates in business administration, the competition may be harmless.

To those who wish to go into greater detail regarding the evolution of the teaching of economics in France I would suggest that they may like to consult the following works or articles:

Henri Hauser, *L'enseignement des sciences sociales. Etat actual de cet enseignement dans les divers pays du monde* (Paris, 1903).

Gaëtan Pirou, " Les Facultés de Droit " in " L'enseignement économique en France et à l'étranger," *Revue d'Economie Politique*, 1937.

Robert Mossé, " Projet de réforme des Etudes économiques en France," *Economie Contemporaine*, June 1951.

Roland G. Beauvois, " A propos de l'enseignement économique dans

les Universités," *Revue de Sciences économiques* (Liége, Belgique, September 1953); there is much valuable material in this well-informed article, including an historical and international background.

The reader may also find interesting and wider problems raised in the Reports on Undergraduate and Graduate Teaching of the American Economic Association, and also the Proceedings of the Talloire Round Table on the University Teaching of Economics, organised by the International Economic Association,[1] which contains an interesting essay on the teaching of economics in France by Professor Emile James of the University of Paris.

ROBERT MOSSÉ

Grenoble.

APPENDIX

Curriculum of Courses for the Licence de Sciences Économiques

	ECONOMIC SUBJECTS	No. of semesters.[2]	NON-ECONOMIC SUBJECTS	No. of semesters.[2]
First Year:				
	General Economics (I)	2	Private Law and Legal Institutions	2
	Financial Institutions	1	History (social and legal)	2
			Political Science and Constitutional Laws	2
			International Institutions	1
	Total for the year: 10 semesters,[2] or 15 hours of lectures per week.			
Second Year:				
	General Economics (II)	2	Private Law	2
	Labour Legislation	1	History (social and legal)	2
			Administrative Law	2
			Criminal Law	1
	Total for the year: as before.			

During the first and the second year, economics represents hardly one-third of the *ex cathedra* teaching. But students may choose seminars in economics and written examinations in economics. Practically, this amounts to devoting half of the time and energy to economics.

Third Year:				
	History of Economic Thought	2	Business Law	2
	Statistics and Methods of "Observation"	2	History of Political Ideas	1
	Taxation	1		
	Economic Fluctuations	1		
	Social Security	1		
Fourth Year:				
	Economic Systems	2	Optional	2
	International Economics	1		
	Management of the Firm and Accounting	1		
	Economic Geography	1		
	Fiscal Policies	1		

Notes. It should be remembered that when entering the *Faculté de Droit* the student, aged about nineteen, has a bachelor's degree, which requires a considerable amount of knowledge, including mathematics and/or philosophy. The new *licencié de sciences économiques*, when he emerges after July 1959, will have a wide education outside economics and will be better acquainted with economics than the former *Docteur es-sciences économiques*. The annual output of such *licenciés de sciences économiques* may be well over five hundred a year (this is a very conservative estimate).

[1] *The University Teaching of Social Sciences: Economics* (Unesco, 1954; obtainable from the R.E.S., price 7*s*.).

[2] 1 semester means 40 hours of lecturing at the usual rate of 3 hours per week. As a compulsory supplement to this "ex cathedra" teaching there are about 3 hours per week of seminars.

CURRENT TOPICS

We offer our best congratulations to our President, Sir Alexander Carr-Saunders, on the conferment in the New Year Honours List of a Knighthood of the Order of the British Empire. We are sure that all Fellows of the Society will be delighted at this recognition of his great services both to the London School of Economics and Political Science and to education in the social sciences throughout the Commonwealth.

We congratulate also Sir Noel Hall on the conferment of a Knighthood. He served for a number of years on the Council of the Society. He has made an outstanding contribution to the improvement of business administration in this country as Principal of the Administrative Staff College at Henley.

We record with great regret the death on January 21st of Sir Arthur Bowley, formerly Professor of Statistics in the University of London. He had been a member of the Royal Economic Society since 1893 and served for many years on the Council; in 1942 he was elected a Vice-President. We hope to publish an obituary notice in a forthcoming issue.

Mr. S. G. Checkland has been elected to the Chair of Economic History in the University of Glasgow.

The following have been admitted to Life Fellowship of the Society:

Brodie, M. B.	McManus, M.	Patel, J. C.
Duhaut, H. R.	Mullan, J. B.	Siebenberg, F. J.
Kashiwazaki, T.	Neild, R. R.	Whatmore, P. W.
Kurihara, Prof. K. K.	Opie, R. G.	

The following have been admitted to Fellowship of the Society:

Akinadewo, S. A.	Breier, Prof. F. A.	Drew, Wm.
Anderson, J. W.	Brown, A. G.	Duff, H.
Apara, O.	Camus y del Rio, E. F.	Duffy, J. P.
Aryee, C. A.	Chee, C. B.	Fee, T. C.
Booz, P.	Chiwuze, H. D. O.	Frank, A. G.
Bose, B. C.	Constantinou, A. M.	Franklin, D. W. V.
Bowes, C. J. L.	Cuff, P. B. H.	Geraghty, J. B.
Braee, G. P.	Das, V. K. R.	Ghosh, J. J.

Goss, R. O.
Gupta, K. L.
Hadjigeorghiou, A.
Haigh, B. W.
Hanauer, J. A.
Haring, J. E.
Hines, Prof. L. G.
Jones, R. A.
Kenan, P. B.
Kermode, G. O.
Kitamura, H.
Krishnamurti, Prof. L. R.
Kung, T. S. K.
Masilamani, W. L.
McCulloch, V. C.
McIntyre, M. A.
Mettle-Nunoo, B. A.
Mukerji, S. C.
Nouth, P.
Ølgaard, A. L.
Osibolu, Miss C. O.
Panda, D.
Perryman, F. D.
Platten, J. D. R.
Price, E. H. M.
Quinn, J. W.
Rogers, J. W. T.
Ruparelia, V. J.
Rybczynski, T. M.
Sagar, R. D.
Somasundaram, S.
Sundram, S. T.
Taylor, G. V.
Tripathy, S.
Uma, K. I.
Vasnaik, M. A. J.
Whitehouse, J.
Williams, R.

THE following have been admitted to Library Membership of the Society:

Banco Nacional do Desenvolvimento Economico, Rio de Janeiro.
Ellen Clarke Bertrand Library, Bucknell University, Pennsylvania.
Humboldt State College Library, California.
Korea Research Center, Seoul, Korea.
Matthews Library, Arizona State College, Tempe, Arizona.
National Planning Committee, Cairo.
State Statistical Bureau, Calcutta.
Volkswirtschaftliches Seminar, Universistat, Gottingen.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

VOL. 119, PART 3, 1956. *United Kingdom Indices of Wholesale Prices, 1949–1955:* H. S. PHILLIPS. *The Television Audience in the United Kingdom:* B. P. EMMETT. *Some Theory of Index Numbers:* Y. P. SENG. *A Geometrical Derivation of the Analyses of Covariance and Variance:* C. P. COX. *Note on the History of Sampling Methods in Russia:* S. S. ZARCOVIĆ.

VOL. 119, PART 4, 1956. *Estimating Expenditure, Saving and Income from Household Budgets:* D. COLE and J. E. G. UTTING. *The Cost of Road Accidents:* D. J. REYNOLDS. *The New Zealand Agricultural Sample Survey:* W. B. TAYLOR and D. V. P. CLEMENT. *Some Theory of Index Numbers: II: Maintenance of Continuity by the Assumption of Proportionality of the New Index Number to the Old Index:* Y. P. SENG.

Applied Statistics

VOL. V, NO. 3, NOVEMBER 1956. *Statistics in Hospital Planning and Design:* N. T. J. BAILEY. *Monte Carlo Methods and Industrial Problems:* W. N. JESSOP. *The Allocation of Scarce Materials Between Products:* N. WILLIAMS. *Industrial Censuses in Great Britain and the United States:* R. J. MAURICE. *A Technique for Studying the Effects of a Television Broadcast:* W. A. BELSON. *Missing Values in Experiments Analysed on Automatic Computers:* M. HEALY and M. WESTMACOTT. *A Comment on the Construction of Price Index Numbers:* K. S. BANERJEE.

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VOL. XXIII, NO. 92, NOVEMBER 1956. *Seven Centuries of the Prices of Consumables, Compared with Builders' Wage-rates:* E. H. PHELPS BROWN and S. V. HOPKINS. *Post-war Wage Bargaining in the United States:* H. M. DOUTY. *Seamen's Sixpences: An Index of Commercial Activity, 1697–1828:* R. DAVIS. *Iron and Steel Prices:* L. FOLDES. *Factor Endowment and Relative Commodity Prices: A Comment:* E. J. MISHAN. *Official Economic Statistics:* R. G. D. ALLEN. *The Royal Commission on the Taxation of Profits and Income:* A. R. PREST.

The Review of Economic Studies

VOL. XXIV, NO. 63, 1956–57. *Factor Proportions and the Heckscher–Ohlin Theorem:* R. W. JONES. *The General Theory of Second Best:* R. G. LIPSEY and R. K. LANCASTER. *Second Thoughts on Capital-intensity of Investment:* M. H. DOBB. *On the Measurement of Excess Capacity in Retailing:* R. H. HOLTON. *Price Policy with a Branded Product:* I. F. PEARCE and L. R. AMEY. *Customs Unions from a Single-country Viewpoint:* F. GEHRELS. *A Comment on Dr. Klein's Interpretation of Leontief's System:* M. MORISHIMA; *The Interpretation of Leontief's System—a Reply:* L. R. KLEIN. *Mr. Ritter on Monetary and Fiscal Policy:* R. TURVEY.

Oxford Economic Papers

VOL. 8, NO. 3, OCTOBER 1956. *The Influence of Distribution Costs and Direct Investments on British Exports to Canada:* T. E. PENNIE. *Liquidity Ratios and Funding in Monetary Control:* A. E. DE JASAY. *Analysis of the Generation of Price Inflation: a Study of Cost and Price Changes in the United Kingdom 1946–54:* J. C. R. DOW. *Direct Taxation and Economic Growth:* U. K. HICKS.

Bulletin of the Oxford University Institute of Statistics

VOL. 18, NO. 2, MAY 1956. *The Variability of Engineering Earnings:* T. P. HILL and K. G. J. C. KNOWLES. *Small Manufacturing Businesses:* J. A. BATES and M. STEWART. *Capital Intensity of Industries:* V. V. BHATT. *A "Human Needs" Diet: Spring 1956:* T. SCHULZ.

VOL. 18, NO. 3, AUGUST 1956. *Exploration in Savings Behaviour:* M. R. FISHER. *The Nation's Intellectual Investment:* P. J. D. WILES.

VOL. 18, NO. 4, NOVEMBER 1956. *Savings and Finances of the Upper Income Classes:* L. R. KLEIN, K. H. STRAW and P. VANDOME. *The Re-organisation of Fruit and Vegetable Whole-*

sale Marketing: G. ALLEN. *Statistical Measures of Concentration in Business:* J. M. BLAIR. *The New Look in Monopoly Policy:* M. HALL. *A "Human Needs" Diet: Autumn 1956:* T. SCHULZ.

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VOL. XXIV, No. 3, SEPTEMBER 1956. *Patterns of Public Revenue and Expenditure:* A. M. MARTIN and W. A. LEWIS. *The Growth of U.S. Investment in U.K. Manufacturing Industry, 1856–1940:* J. H. DUNNING. *Notes on the Theory of Replacement:* W. PETERS. *House Building in the South Wales Coalfield, 1851–1913:* H. RICHARDS and P. LEWIS.

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VOL. III, No. 3, OCTOBER 1956. *Industrial Investment in Fixed Capital: A Reconsideration:* R. F. HENDERSON. *The Profitability of the Scottish Note-issues:* M. GASKIN. *Malthus's Theory of Demand and its Influence on Value Theory:* V. E. SMITH. *Reflections on Inflation:* A. D. CAMPBELL. *Trends in the Output and Exports of Merchant Ships:* J. R. PARKINSON.

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VOL. X, NO. 2, NOVEMBER 1956. *Roman-Catholicism and Fertility in the Netherlands:* F. VAN HEEK. *The Sources of Indian Emigration to Fiji:* K. L. GILLION. *A Survey of Indian Immigration to British Tropical Colonies to 1910:* I. M. CUMPSTON. *The Population Census of Northern Nigeria 1952: Problems and Results:* R. M. PROTHERO. *Divorce in Israel:* H. S. HALEVI. *Estimating the Fertility and Mortality of African Populations from the Total Number of Children Ever Born and the Number of these Still Living:* C. A. L. MYBURGH.

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VOL. VIII, NO. 6, 1956. *Short-term Production Variations for Horticultural Products and the Marketing System:* G. R. ALLEN. *Research Methodology and Peasant Agriculture:* E. S. CLAYTON. *The Work of the Agricultural Economics Research Institute:* K. E. HUNT.

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VOL. 82, PART II, NO. 361, 1956. *A System of Distribution of Surplus for Participating Deferred Annuities:* J. EDEY. *Modern Statistics in Business and Commerce:* M. G. KENDALL. *Which comes first, Probability or Statistics?:* I. J. GOOD.

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VOL. 7, NO. 4, OCTOBER 1956. *The Effect of Derating and Rerating on Industrial Costs. Inflation, Inventory Valuation Methods and Business Cycles:* A. R. CERF. *Cost Accounting for a Small Manufacturing Concern:* R. G. ALLYN. *Accounting in Relation to Law:* H. MCCREDIE. *Capital Changes:* F. S. BRAY.

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VOL. 106, NO. 370, NOVEMBER 1956. *Towards Free Trade. The Coal–Steel Example. Middle East Oil: Europe's Lifeblood? Banking Reform in Belgium:* G. GORDON. *The Governor Appraises his Weapons.*

VOL. 106, NO. 371, DECEMBER 1956. *Counting the Cost. Reinforce the Reserves? The Building of Benelux:* J. E. MEADE. *Doublethink about Transport Deficits:* J. E. HARTSHORN. *Rising Output and Inflation:* D. J. COPPOCK.

VOL. 107, NO. 372, JANUARY 1957. *Deflation after Suez? First Aid for Sterling. Can India Afford the Five-year Plan? Australia's New Look:* J. O. N. PERKINS. *Capital Formation in the Cold War:* G. HUTTON. *Window-dressing in a Minor Key:* E. NEVIN.

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VOL. CLXXXII, NO. 1353, DECEMBER 1956. *Approach to Convertibility:* SIR R. HAWTREY. *The Rise in Personal Savings:* S. FROWEN. *Five Years of the Colombo Plan:* R. KUMAR. *Survey of Economic Conditions in the U.S.A.: Election Aftermath and International Uncertainties. The Cheque Endorsement Committee Report:* C. B. DROVER. *Treasury Control:* I. GOWAN.

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VOL. XXXI, NO. 4, NOVEMBER 1956. *Britain and the Common Market. The Financial Machinery. The Spearhead of the British Exporting Effort.*

District Bank Review

No. 120, DECEMBER 1956. *The Future of Indirect Taxation:* R. C. TRESS. *Agriculture and the Nation:* SIR J. TURNER. *European Free Trade.*

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NOVEMBER 1956. *The Treasury: Part II: Economic and Financial Policy. New Inducements to Saving.*

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No. 36, NOVEMBER 1956. *The Petroleum Industry:* LORD STRATHALMOND. *Using National Income Statistics:* C. T. SAUNDERS.

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No. 32, DECEMBER 1956. *Economists on "Stability and Progress":* R. S. SAYERS. *The Defence Budget:* U. K. HICKS. *The Banker M.P.*

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NOVEMBER 1956. *Public Opinion and the Cost of Living Index:* H. CROOME. *India's Second Plan: Needs and Opportunities:* G. TYSON. *Britain's Dependence upon Agricultural Imports:* C. CLARK.

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VOL. XXII, No. 404, DECEMBER 1956. *Solving Traffic Problems: II: Plans for Britain.*
VOL. XXII, No. 405, DECEMBER 1956. *The Spaak Report: a summarised translation of Part I.*

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VOL. XXIV, No. 152, DECEMBER 1956. *Housing Floor Space Standards: The Downward Trend:* R. H. REISS. *The Reclamation of Tidal Lands:* L. D. STAMP. *Birmingham's Overspill Problems. A Welsh County Town and its Development:* T. A. LLOYD.
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VOL. 27, No. 1, NOVEMBER 1956. *The State of the Ports:* F. H. CAVE. *The Army Transportation Service:* D. R. STENHOUSE. *Subsidy in Air Transport:* R. W. SPURGEON.

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VOL. 6, No. 2, APRIL 1956. *Consumer Protection in Scandinavia:* L. OVESEN. *Restrictive Practices: The New British Approach:* G. DARLING. *The West German Cartel Bill:* K. KÜHNE. *Retailing and Restrictions:* W. P. WATKINS. *Report from Sweden:* T. OHDE.
VOL. 6, No. 3, JULY 1956. *The Costs of Hire Purchase:* J. MARS. *Restrictive Practices: Danish Legislation:* N. BANKE. *Patent Medicines:* F. KNOX. *Alternative to Nationalisation:* A. KAY.

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No. 23, DECEMBER 1956. *Trends in Twine Consumption: II. Resurgence of German Twine Industry.*

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VOL. 22, No. 4, NOVEMBER 1956. *The Changing Influence of the United States on the Canadian Economy:* J. D. GIBSON. *Likely Trends in Canadian–American Political Relations:* G. V. FERGUSON. *Non-resident Ownership of Canadian Industry:* C. D. BLYTH and E. B. CARTY.

The International Allocation of Resources: S. POLLOCK. *The Role of the Canadian Life Insurance Companies in the Post-war Capital Market:* W. C. HOOD and O. W. MAIN. *Religious Affiliation and Electoral Behaviour:* J. MEISEL. *The Customs Administration in Canadian Historical Development:* G. BLAKE. *Staff Relations in the Canadian Federal Public Service:* S. J. FRANKEL. *Government Conciliation in Labour Disputes:* W. G. PHILLIPS. *Interest in News and the Selection of Sources:* K. LANG.

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VOL. XXXII, NO. 2, JULY–SEPTEMBER 1956. *Note sur la construction domiciliaire:* J. PARIZEAU. *Les besoins futurs de nouveaux logements au Canada, jusqu'en 1971:* J. HENRIPIN. *La législation fédérale sur l'habitation et ses résultats:* R. PARENTEAU. *Les principales industries manufacturières du Canada:* B. BROUILLETTE. *Le problème de la déductibilité de l'impôt provincial sur le revenu dans les relations fédérales-provinciales canadiennes:* F. A. ANGERS. *La structure des emplois au Canada 1941–1951:* P. ALLEN. *Les causes et les risques d'aggravation de l'inflation en Grande-Bretagne:* V. ROUQUET LA GARRIGUE.

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VOL. 24, NO. 3, SEPTEMBER 1956. *The Need for Currency Stabilization:* W. J. BUSSCHAU. *The Union's Economy—a Review:* E. H. D. ARNDT. *The Economic Writings of David Hume—A Reassessment:* M. ARKIN. *On the Results of the South African Business Opinion Survey:* J. C. DU PLESSIS. *Enige Beskouings oor Huurkoopkrediet in Suit-Afrika:* T. VAN WAASDIJK. *'N paar Gedagtes oor Krediet in die Kleinhandel:* C. L. DE BRUYN.

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VOL. II, NO. 1, JULY–AUGUST 1956. *The Role of Foreign Capital in the South African Economy:* E. H. LOUW. *The Economic Development of the South African Bantu Areas:* J. A. LOMBARD.

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VOL. IV, NO. 1, JULY 1956. *Progress in Production Technique and the Structure of the Capital Goods Industries:* R. BALAKRISHNA. *The Effects of Adverse Income Terms of Trade on the Secular Growth of Underdeveloped Countries:* F. MEHTA. *The Theory of Taxation and Saving:* D. JHA. *Indian Immigrants in Kenya: A Survey:* G. R. RAO. *Capital Formation and Choice of Techniques in Underdeveloped Areas:* G. R. DEEKSHIT, R. K. PATIL and K. R. DATYE.

Sankhyā

VOL. 17, PART 1, JUNE 1956. *Some Contributions to the Design of Sample Surveys:* T. KITAGAWA. *Quadratic Forms in Normally Distributed Random Variables:* J. GURLAND. *A Method of Discrimination in Time Series Analysis: II:* A. RUDRA. *On the Testing of Outlying Observations:* A. KUDO. *On Some Quick Decision Methods in Multivariate and Univariate Analysis:* J. ROY. *On the Method of Overlapping Maps in Sample Surveys:* D. RAJ.

VOL. 17, PART 2, AUGUST 1956. *On the Recovery of Inter-block Information in Varietal Trials:* C. R. RAO. *Classification and Analysis of Linked Block Designs:* J. ROY and R. G. LAHA. *On the Dual of a PBIB Design and a New Class of Designs with Two Replications:* C. S. RAMAKRISHNAN. *Fractional Replication in Asymmetrical Factorial Designs and Partially Balanced Arrays:* I. M. CHAKRAVARTI. *A General Class of Quasifactorial and Related Designs:* C. R. RAO. *Two Associate Partially Balanced Designs Involving Three Replications:* J. ROY and R. G. LAHA. *Some Series of Balanced Incomplete Block Designs:* D. A. SPROTT. *The Concept of Asymptotic Efficiency:* D. BASU. *A Note on the Determination of Optimum Probabilities in Sampling without Replacement:* D. RAJ.

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VOL. 2, NO. 4, OCTOBER 1956. *Changing Pattern of Foreign Investment. Recent Trends in Primary Producers' Trade. A Symposium of Capital Needs.*

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Development: H. RAHMAN. *Non-inflationary Mobilization of Surplus Labour:* P. HASAN. *Rural Credit:* D. H. BOKHARI. *Problems of Agricultural Finance in Pakistan:* H. ULLAH. *Problems of Rural Credit in Pakistan:* K. M. B. AHMAD KHAN. *A Scheme for Agricultural Credit in East Bengal:* A. GHANI KHAN. *Marketing of Pakistan's Cotton Cloth Exports:* M. R. SHARIF. *Recent Tenancy Legislation in East Bengal and After:* S. RAHMAN.

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VOL. 3, NO. 2, MARCH 1956. *Control of Inflation:* J. B. KELEGAMA. *Propensity to Consume and the Multiplier Effect in Ceylon:* K. THARMARATNAM. *The Soap Industry in Ceylon:* W. S. M. FERNANDO. *Long-term Contracts and Bulk Buying:* S. B. DE SILVA. *The Place of Small Scale Industry in National Planning:* F. R. JAYASURIYA and N. K. SARKAR. *The Ceylon Peasant in Industry:* E. B. TISSEVERASINGHE. *The Future of the Tea Industry in Ceylon:* F. R. JAYASURIYA.

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VOL. V, NO. 2, AUGUST 1956. *Quotas in the International Monetary Fund:* O. L. ALTMAN. *Strategic Factors in Balance of Payments Adjustment:* E. M. BERNSTEIN. *The Use of Bilateral Agreement Currencies for Trade with Third Countries:* B. A. DE VRIES and F. A. G. KEESING. *U.S. Exports of Surplus Commodities:* F. C. DIRKS. *Changes in Competitive Strength and Export Shares of Major Industrial Countries:* J. M. FLEMING and S. C. TSIANG. *Interest Rates in the Organized Money Markets of Underdeveloped Countries:* U. TUN WAI. *The Repercussions of Economic Fluctuation in the United States on other Parts of the World:* J. J. POLAK. *The Fund Agreement in the Courts: IV:* J. GOLD.

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VOL. IX, NO. 12, DECEMBER 1956. Usual statistical material.

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VOL. LXXIV, NO. 5, NOVEMBER 1956. *Women's Changing Role in the United States Employment Market:* E. E. MUNTZ. *Welfare of Seamen on Board Ship:* F. HASLUND. *The Medical Examination in Vocational Guidance:* M. PARMENTIER-BELOUX.

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L'Industria

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ADLER (M. K.). Modern Market Research. A guide for business executives. London: Crosby Lockwood, 1956. 7½". Pp. 158. 15*s*.

[To be reviewed.]

ALLEN (R. G. D.). Mathematical Economics. London: Macmillan, 1956. 9". Pp. xiii + 768. 63*s*.

[To be reviewed.]

BENHAM (F.). The Colombo Plan, and other essays. London: Royal Institute of International Affairs, 1956. 7½". Pp. 89. 7*s*. 6*d*.

[To be reviewed.]

COLE (G. D. H.). The Post-War Condition of Britain. London: Routledge & Kegan Paul, 1956. 9". Pp. xix + 483. 40*s*.

[To be reviewed.]

DERRICK (P.). A Co-operative Approach to Socialism. London: National Labour Press for the Socialist Christian League (97a Stroud Creen Road, London, N.4.), 1956. 8½". Pp. 62. 2*s*.

[This is a plea for the extension of the principle of " mutualisation " in industry. The author recommends as a very important step towards this objective the permanent statutory limitation of dividends. He considers the ways in which this could be done and answers a number of objections relating to possible effects on the supply of saving.]

DUFF (E.). The Social Thought of the World Council of Churches. London: Longmans, 1956. 9″. Pp. 339. 25*s*.

[After introductory sections on the history and organisation of the World Council of Churches, Father Duff turns to his main theme, which is the social philosophy and policy that has been worked out by the Council. He sees the characteristic contribution of the Ecumenical Movement as showing a " Third Way " and helping to resolve the sterile opposition between out-and-out capitalism and communism.]

DUNSIRE (A.) (Ed.). The Making of an Administrator. Manchester: Manchester University Press for the Royal Institute of Public Administration, 1956. 7½″. Pp. 125. 10*s*. 6*d*.

[To be reviewed.]

ELKAN (W.). An African Labour Force. Two case studies in East African factory employment. East African Studies, No. 7. Kampala, Uganda: East African Institute of Social Research, 1956. 9½″. Pp. 59. 8*s*. 6*d*.

[This describes investigations carried out in two factories of the East Africa Tobacco Company in Uganda. It is a valuable contribution to the study of the supply of labour for urban employment in Africa. High turnover and absenteeism were among the chief sources of concern to the Company, and the author considers the extent to which these were due to particular aspects of the employer's policy and to more general conditions respectively. One of the factories studied is unusual in Uganda in offering a substantial amount of employment to women. The social and economic circumstances affecting the employment of women provides the subject of one of Mr. Elkan's most interesting chapters.]

GAITSKELL (H.). Socialism and Nationalisation. Fabian Tract 300. London: Fabian Society, 1956. 8½″. Pp. 36. 2*s*.

[In this pamphlet, most of which was written several years ago, Mr. Gaitskell considers the traditional arguments for nationalisation in the light of recent experience and present circumstances. He argues that nationalisation is an instrument rather than an end in itself, and only one of a number of possible instruments. He believes that the policy of nationalisation so far pursued has on balance been successful, and that the traditional arguments for it, though in some respects weakened, have not been destroyed. At the same time he suggests that other means of extending the domain of public ownership may perhaps turn out to have more potentialities in the future.]

GOFFMAN (E.). The Presentation of Self in Everyday Life. Edinburgh: Social Sciences Research Centre, University of Edinburgh (39 George Square, Edinburgh 8), 1956. 8½″. Pp. 162. 10*s*.

[This is a sociological analysis of conduct. Its starting point is the idea that conduct has always in greater or less degree an " expressive " aspect, *i.e.*, a quality of conveying to the onlooker that the agent has certain personal attributes. This idea is then pushed further to provide an interpretation of conduct based on the analogy of a dramatic performance. Not merely does the individual play a role: members of a group, such as a family, a profession, etc., perform as a team to convey to outsiders an impression of the attributes of the group. The author develops his idea clearly and ingeniously and with many entertaining examples. The reader is left in a little doubt as to the extent to which this " dramaturgic " analysis of behaviour is intended as merely a helpful analogy or as something more than this.]

HAHN (L. A.). Common Sense Economics. London: Abelard-Schuman, 1956. 8½″. Pp. 244. 18*s*. 6*d*.

[To be reviewed.]

HARROD (R. F.). Foundations of Inductive Logic. London: Macmillan, 1956. 9″. Pp. v + 290. 24*s*.

[To be reviewed.]

HEYWORTH (LORD). The Control Centre for an International Business: A Study of the Factors Relevant to the Location of its Headquarters. The Stamp Memorial Lecture 1956. London: The Athlone Press, University of London, 1956. 8½″. Pp. 28. 3*s*.

[The factors considered by Lord Heyworth are those affecting a holding company with subsidiaries operating throughout the world. His chief attention is devoted to questions of taxation—the taxation of staff salaries and company profits, and the arrangements in force in different countries for double-taxation relief. He also attaches importance to the supply of capital and managerial personnel, the stringency or otherwise of exchange control, company legislation and anti-monopoly policy. Lord Heyworth's comparisons have particular reference to the United Kingdom, the Netherlands and the United States as alternative control centres for an international business.]

HEYWORTH (LORD). The Managers. London: Unilever, 1956. 8″. Pp. 18.

[This is the text of an address delivered by the chairman at the annual general meeting of Unilever on May 24, 1956. The speaker describes the procedure adopted in Unilever for the recruitment, training and promotion of managerial staff.]

HUNT (K. E.) and CLARK (K. R.). The State of British Agriculture, 1955–6. Oxford: University of Oxford Agricultural Economics Research Institute, 1956. 13″. Pp. 128. 10*s*.

[This is a collection of tables and charts, not accompanied by any text. It is a most useful compilation. The very extensive data shown are not by any means confined to 1955–56. Most of the series are taken back to about 1936, and many of them to much earlier, and briefer comparative data are also given relating to agriculture in other countries.]

Industrial and Commercial Associations. A Course of Studies Paper. Henley on Thames: The Administrative Staff College, 1956. 9″. Pp. 24. 3*s*.

[This paper contains a factual account of the structure and functions of the various organisations described by the title. These include trade associations, employers' associations, research associations, chambers of commerce and of trade, and national bodies such as the Federation of British Industries.]

INFIELD (H. F.). The Sociological Study of Co-operation: An Outline. Co-operative College Papers, No. 3. Loughborough: Education Department, Co-operative Union (Stanford Hall, Loughborough), 1956. 9″. Pp. 72. 1*s*.

[The author has been a pioneer in the study of the social relations involved in the different types of co-operative organisation. He here describes the outlines of his conclusions on the subject and their significance for the future of the co-operative movement. Further chapters deal with methods of research in the field and two case-studies.]

INTERNATIONAL BANKING SUMMER SCHOOL. International Banking and Foreign Trade. Institutions, Policies, and Practices in the Western Hemisphere. A series of lectures delivered at the Ninth Session, Rutgers University, New Jersey, July 1956. London: Europa Publications for the Graduate School of Banking and the Institute of Bankers, 1956. 8½″. Pp. 261. 30*s*.

[This contains ten lectures by American bankers and economists. The most substantial contribution is a long paper by Professor B. H. Beckhart on recent United States monetary policy, accompanied by twenty pages of charts.]

LEUBUSCHER (C.). Bulk Buying from the Colonies. A study of the bulk purchase of colonial commodities by the United Kingdom Government. London: Oxford University Press for the Royal Institute of International Affairs, 1956. 9″. Pp. 206. 30*s*.

[To be reviewed.]

LICHFIELD (N.). Economics of Planned Development. London: The Estates Gazette (47 Museum Street, W.C.1), 1956. 9½″. Pp. xxiii + 460. 47*s*. 6*d*.

[To be reviewed.]

LITTLETON (A. C.) and YAMEY (B. S.) (Eds.) for the Association of University Teachers of Accounting and the American Accounting Association. Studies in the History of Accounting. London: Sweet & Maxwell, 1956. 10″. Pp. 392. 50*s*.

[This contains a collection of essays on the history of accounting from ancient times until about 1900. It contains twenty-four contributions, all but eight of which are published for the first time. The volume is sponsored jointly by the Association of University Teachers of Accounting and the Amerian Accounting Association. The editors have sought to make the collection of interest both to specialists in the history of accounting and to economic and social historians generally. One of their major objectives, though not their only one, is to trace the origins and development of the technique of double-entry.]

London Correspondence Inward from Eden Colville, 1849–1852. Edited by E. E. RICH, assisted by A. M. JOHNSON. London: Hudson's Bay Record Society, 1856. 9½″. Pp. CXV + 300.

[The bulk of the correspondence contained in this volume was written by Eden Colville, Governor of Rupert's Land, from Fort Garry in the Red River Settlement. Professor Morton's long introduction is largely concerned with the circumstances that led to Colville's appointment to this post.]

LOVEDAY (A.). Reflections on International Administration. London: Oxford University Press, 1956. 9″. Pp. xiii + 334. 42*s*.

[To be reviewed.]

MYRDAL (G.). An International Economy. Problems and Prospects. London: Routledge & Kegan Paul, 1956. 9½″. Pp. 381. 37*s*. 6*d*.

[To be reviewed.]

New Sources of Local Revenue. Report of a study group of the Royal Institute of Public Administration. London: Allen & Unwin for the Royal Institute of Public Administration, 1956. 9″. Pp. 260. 25*s*.

[To be reviewed.]

PARSONS (T.) and SMELSER (N. J.). Economy and Society. A study in the integration of economic and social theory. In the International Library of Sociology and Social Reconstruction. London: Routledge & Kegan Paul, 1956. 9″. Pp. xvii + 322. 35*s*.

[To be reviewed.]

ROBERTSON (A. H.). The Council of Europe. Its structure, functions and achievements. Published under the auspices of the London Institute of World Affairs. London: Stevens, 1956. 10″. Pp. 252. 42*s*.

[The author describes the origins of the Council, its membership and structure, and the statutory provisions by which it is governed. He then treats its functions in the political sphere and in relation to economic, social, cultural and legal questions and to the problem of human rights. He concludes by assessing its achievements and prospects. He believes that though it is still in an early stage of its evolution, its success in establishing a vigorous Consultative Assembly has been an important one, and that further advances depend largely on the strength of the ideal of European unity among the members of the Assembly.]

ROGOW (A. A.) assisted by SHORE (P.). The Labour Government and British Industry, 1945–1951. Oxford: Basil Blackwell, 1955. 8½″. Pp. vii + 196. 18*s*.

[To be reviewed.]

SAYERS (R. S.). Central Banking after Bagehot. London: Oxford University Press, 1957. 8½″. Pp. 149. 18*s*.

[To be reviewed.]

STONE (L.). An Elizabethan: Sir Horatio Palavicino. London: Oxford University Press, 1956. 9″. Pp. 345. 45*s*.

[This is the story not of an "Italianate Englishman" but of an Anglicised (and Anglicanised) Italian who started as the Antwerp agent of his family's alum concern and ended as a quarrelsome Cambridgeshire squire, with land also in Norfolk and Essex, a London house and a total estate (it was alleged) of £100,000. He had built up this fortune by his activities as a royal agent (filling the void left by the death of Gresham), as a roving Ambassador and as an astute speculator (save that he twice failed to bring off a corner in pepper). All this is narrated by Mr. Stone in a book which is at once scholarly and lively, although the details of the financing of the royal expeditions make rather heavy going for the general reader. In addition, much light is thrown on the confused and hectic scene of the eighties and nineties; *e.g.*, "the ramshackle system of governmental controls, patents and licenses"; and the peace negotiations of 1586 carried on secretly by four members of the Council, each in isolation from the rest, and with none of them giving the slightest information to the English general in the field! There are three interesting appendices, on the European money-market in 1587, and on the Intelligence Services of Walsingham and Robert Cecil.]

THOMPSON (L.). The Challenge of Change. London: Oxford University Press, 1956. 7″. Pp. 127. 5*s*.

[This is an informal account of the Duke of Edinburgh's Study Conference on Human Problems of Industrial Communities within the Commonwealth and Empire, held in Oxford in July 1956. The author attended the conference as correspondent of the *News Chronicle*. His book draws extensively on material provided by speakers at the conference, but it is designed as essentially a personal view of the themes that were discussed. The style is light-hearted but the intention serious.]

WAGNER (G.). The Bantu of North Kavirondo. Volume II: Economic Life. Edited by L. P. MAIR. London: Oxford University Press for the International African Institute, 1956. 9″. Pp. 184. 36*s*.

[This is an anthropological study descriptive of the economic life of the Logoli and Vugusu people in the Nyanza province of Kenya before the Second World War. The economist might expect this book to have something to say about the forces changing the African subsistence economy to the exchange economy, but its interest for economists is limited. Influences such as pressure of population on the land, the convenience of purchase of European manufactured products like salt or the hoe, or Christian missionary work, are only occasionally hinted at, for example, ". . . the economically advanced section consisted almost exclusively of Christians . . . whose mode of life was guided by the application of the same principles [of uniform and persistent standards of consumption] . . ." (p. 179). And again, apart from a paragraph on p. 97, there is no mention of the effect of the increasing subdivision of land on the productivity of African agriculture, and the economist will fail to discover in this book the extent and reason for the migration of African labour. It is only the last chapter of the book, and perhaps the sections on property rights and duties in land and cattle, which has interest for the economist. This chapter, apart from mentioning cases of African enterprise in the establishment of markets with little capital, describes the nature of the goods supplied and demanded by tribes, the nature of goods exported and imported into the area, and finally, on the basis of a sample (not adequately defined) of 344 families in South Maragoli, presents family budgets for the economically advanced, semi-advanced and conservative.]

WIGHAM (E. L.). Trade Unions. Home University Library, No. 229. London: Oxford University Press, 1956. 7″. Pp. 277. 7*s*. 6*d*.

[This small book by the labour correspondent of *The Times* covers a wide field. It deals with all aspects of British trade unionism—its past, its present and its future, its activities at home and its relationships abroad. Particular attention is paid to the ten years since the Second World War and the many problems which trade unions have had to face during that period in their relations with their own members, with industry and with the State. The author considers that fundamental changes in trade-union structure and policy will be needed in the near future—changes which the trade-union movement has from time to time tentatively embarked upon, but never with sufficient determination to carry them to their necessary conclusion. The fundamental problem, he considers, is that of wages policy in full employment. He suggests various ways in which it could be tackled, but admits that there may be no practical method of dealing with it in a relatively free country. Yet, although he sees no sign of present willingness of trade unions to accept wage regulation, he considers that " they will have to come round to it in the end, though clearly there will have to be a national policy to deal with other forms of income as well."]

WIGHTMAN (D.). Economic Co-operation in Europe. A study of the United Nations Economic Commission for Europe. Published under the auspices of the European Center of the Carnegie Endowment for International Peace. London: Stevens, and Heinemann, 1956. 9″. Pp. 288. 21*s*.

[Reviewed in this issue.]

Canadian

LOGAN (H. A.). State Intervention and Assistance in Collective Bargaining. The Canadian experience, 1943–1954. Canadian Studies in Economics, No. 6. Toronto: University of Toronto Press (London: Oxford University Press), 1956. 10″. Pp. 176. 24*s*.

[This is a study of the Canadian system of state participation in collective bargaining since its inception during the War. The first eight chapters describe the forms this participation has taken in the country as a whole and in its leading industrial provinces. The two concluding chapters analyse the effects of the legislation and the chief issues that have arisen from the experience of its working to date. Especial attention is given to the conciliation system, which has attracted a particular amount of adverse comment.]

NEUFELD (E. P.). Bank of Canada Operations, 1935–54. Canadian Studies in Economics, No. 5. Toronto: University of Toronto Press (London: Oxford University Press), 1955. 10″. Pp. 221.

[This lucidly written monograph treats its subject first by topic—relation between Bank and Government, objectives of policy, techniques of control—and then chronologically—pre-war, war-time and post-war. The author's appraisal is on the whole a favourable one, and he believes that the varied experiences the Bank has been through have equipped it with the prestige and the techniques that are the necessary though not sufficient conditions for success in the future.]

ROSENBERG (L.). Population Characteristics of the Jewish Community of Montreal. Canadian Jewish Population Studies. Montreal: Bureau of Social and Economic Research, Canadian Jewish Congress, 1956. 11″. Pp. 58.

[This is a factual study based on Canadian census material. The characteristics analysed include ethnic pattern, conjugal condition, Jewish origin and Jewish religion, place of birth, size of family, language and mother tongue, higher education and school attendance.]

American

ADAMS (C. F.) and ADAMS (H.). Chapters of Erie. Ithaca, New York: Cornell University Press (London: Oxford University Press), 1956. 7½″. Pp. 193. 11*s.* 6*d.*

[These three celebrated essays by the brothers Adams were first published in the years 1869–71. They are concerned with the Erie Railway wars of that time and the financial doings of Gould and Fisk.]

ANTHONY (R. N.) (Ed.). Automatic Data Processing Conference, September 1955. Proceedings. Boston, Mass.: Graduate School of Business Administration, Harvard University (London: Bailey Bros. & Swinfen), 1956. 8″. Pp. 194. 28*s.*

[The purpose of this conference was to improve understanding between the experts in automatic data processing and the business-men who use their results. The text contains twelve addresses with discussion. The topics treated include the basic principles of automatic data processing, the issue between centralisation and decentralisation in this sphere and the criteria for selecting equipment.]

ATKINSON (T. R.). The Pattern of Financial Asset Ownership. Wisconsin Individuals, 1949. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Geoffrey Cumberlege), 1956. 9″. Pp. 176. 30*s.*

[Wisconsin State income-tax returns are used to analyse the composition of individuals' holdings of financial assets, with the individuals classified according to income, occupation and place of residence. The general outline of the results is much as might have been expected. The proportion of corporate equities to total financial assets rises with income, and in the upper income groups a particularly important place is taken by closely held or seldom traded stocks, especially in corporations in which the individual is employed. This finding is taken to support the idea that one of the real problems of small business is to obtain funds without diluting control. The chief purpose of the extensive detailed analysis of the data which the author engages in is to cast light on the flow of investment funds, and the bearing of the data on questions of income distribution is deliberately treated more lightly. The ratio of total financial assets to income in the different groups is, for example, not shown.]

BAIN (J. S.). Barriers to New Competition. Their character and consequences in manufacturing industries. Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1956. 9½″. Pp. v + 329. 45*s.*

[To be reviewed.]

BLUMENTHAL (W. M.). Codetermination in the German Steel Industry. A report of experience. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1956. 9″. Pp. 114. $3.00.

[Under the system of codetermination, as now laid down by law for the German steel industry, representatives of labour make up half of the board of supervision of a concern. The powers of this board are for the most part confined to broad strategic decisions, but a labour representative, the *Arbeitsdirektor*, is also added to the board of management, which is responsible for the day-to-day administration. This labour director shares with the technical director and the commercial director all the powers and responsibilities of the board. The present monograph is an assessment of the way the system has worked out. Its effects have been less radical than was expected. The labour representatives have not in any way lost their loyalty to the workers, but in practice a division of spheres of influence has commonly been arrived at by which they are given more or less undisputed control over questions of labour relations while the other members of management retain the chief authority in all other matters. Labour relations have in general improved under codetermination, and earnings of labour have risen by more than in other comparable industries. This has not been accompanied by a correspondingly faster rise in productivity, and the rise in labour cost has therefore been passed on to the consumer. In conclusion, the author suggests that while codetermination may have been particularly suited to German conditions it has not accomplished anything that could not be and has not been achieved in the United States by collective bargaining.]

BURNS (E. M.). Social Security and Public Policy. New York and London: McGraw-Hill, 1956. 9½". Pp. vii + 291. 41*s.* 6*d.*

[To be reviewed].

CHRISTIE (R. A.). Empire in Wood. A history of the Carpenters' Union. Cornell Studies in Industrial and Labor Relations, Vol. VII. Ithaca, New York: Cornell University, 1956. 9½". Pp. xv + 356. $5.50.

[This history of the United Brotherhood of Carpenters and Joiners of America is an unofficial one. The files of the Brotherhood were not made available to the author—hardly surprisingly in view of his evident dislike for many of the characteristics of the type of union it represents. Mr. Christie writes vividly. His narrative is largely concerned with conflicts between personalities and between the Brotherhood and other bodies. This emphasis stems from the character and purpose of the union itself. As interpreted by Mr. Christie, the prime aim of the Brotherhood as a national organisation has been to preserve within its jurisdiction all work in wood and all work also in materials that are now used where wood used to be. This aim of job-preservation in face of changing techniques has been achieved by an elaborate system of boycotts and alliances with other unions. Wage-determination and collective bargaining on other issues is carried out at the regional level and the central office of the Brotherhood is not normally concerned with them. Despite the great strength of the union, the wages of carpenters have barely held their own in relation to those in other building crafts, and Mr. Christie believes that this reflects the deliberate policy of the Brotherhood's leaders of subordinating all else to job-preservation.]

CRUM (W. L.). Fiscal-Year Reporting for Corporate Income Tax. National Bureau of Economic Research, Technical Paper No. 11. New York: National Bureau of Economic Research, 1956. 9½". Pp. 63. $1.25.

[There has been an increasing tendency recently in the United States for corporations to file their income-tax returns for periods other than the calendar year. This reduces the peak load of auditing for the corporations and to some extent helps to even out the flow of tax receipts, but it adds materially to the difficulty experienced by government economists and others in interpreting the returns and basing forecasts upon them. In this paper Professor Crum provides an elaborate analysis of the extent to which non-calendar-year reporting of corporate income is practised, distinguishing between different lines of industry and different sizes of corporation.]

DAHLBERG (A. O.). National Income Visualized. A graphic portrayal of how economic activity is measured. New York: Columbia University Press (London: Oxford University Press), 1956. 12". Pp. 117. 28*s.*

[This contains an application of a visual device to illustrate the flow of national income. Fifty diagrams are accompanied by an explanatory text and an extensive collection of tables reprinted from the *Survey of Current Business*. The technique employed in the diagrams is in essence the same as that of the circular flow charts that have long been familiar in elementary treatments of social accounting. As used by Dr. Dahlberg, however, the charts are made a good deal more vivid and intelligible by having the flows of expenditure between the stylised houses ("consumers"), factories ("business"), banks, etc., shown as if seen from the air diagonally instead of in the usual two-dimensional plane. This device is used to show in considerable detail and complexity different aspects of the U.S. social accounts.]

FISHER (E. M.) and RAPKIN (C.). The Mutual Mortgage Insurance Fund. A study of the adequacy of its reserves and resources. New York: Columbia University Press (London: Oxford University Press), 1956. 9½". Pp. 162. 32*s.*

[The Mutual Mortgage Insurance Fund was established in 1934 by the Federal Housing Administration. Its function is to bear the contingent liability imposed by the system of federal guarantee of approved mortgages. If a mortgage is foreclosed, the mortgagee may transfer the property to the Federal Housing Administration, receiving in return a debenture of amount equal to that by which he is out of pocket. This debenture becomes payable in cash after a period of years. The subject of the present study is whether the resources of the Fund are sufficient to enable it to be self-supporting in the event of a major depression in the housing market. To some readers the problem may appear rather an artificial one, for if a really serious slump developed, would it very much matter if the Fund had to be supported from other public monies? But the conclusions of the study are in any case reasonably reassuring. In the course of their inquiry the authors provide much interesting information of a more general character about the Federal Housing Administration's operations and policies.]

KATZ (S. I.). Two Approaches to the Exchange-rate Problem: The United Kingdom and Canada. Essays in International Finance, No. 26. Princeton, New Jersey: International Finance Section, Princeton University, 1956. 9". Pp. 19.

[The author argues that the measures taken by the British and Canadian authorities in the last few years to overcome the disadvantages of fixed and flexible exchange rates respectively have

resulted in the experience of the two currencies being surprisingly similar, despite the large apparent difference in arrangements. Mr. Katz's account of developments since 1950 provides some interesting examples of the strengths and weaknesses of the two types of exchange-rate system.]

KAYSEN (C.). United States *v.* United Shoe Machinery Corporation. An economic analysis of an anti-trust case. Harvard Economic Studies, Vol. XCIX. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1956. 8½″. Pp. 404. 52*s*.

[To be reviewed.]

KENDRICK (J. W.). Productivity Trends: Capital and Labor. National Bureau of Economic Research, Occasional Paper 53. New York: National Bureau of Economic Research, 1956. 9″. Pp. 23. $0.50.

[This is a summary of part of a larger study of productivity trends in the United States in preparation at the National Bureau. It shows the rates of growth since 1899 of output per unit of labour input, output per unit of capital input and output per unit of "total" input. These are further analysed according to sub-periods and industry groups. Interesting conclusions include the establishment of a significant positive correlation between rates of growth of production and rates of growth of productivity in the comparison between industries, and of a negative correlation between each of these and changes in product prices. Further evidence is given of the now relatively well-attested tendency of the capital/output ratio to fall since 1919, after twenty years of little change since 1899. While the value of these and other findings is unquestionable, some doubts may be felt about the meaningfulness of the concept of output per unit of "total" input. Total input is measured as a weighted average of input of man-hours and input of capital, the latter valued at its (hypothetical) production cost in the base year. Quite apart from the difficulties of applying this measure consistently, a systematic bias is liable to be introduced as time goes on. A man-hour of labour applied as a direct input will rank as one man-hour, but a man-hour of labour applied indirectly in the making of capital equipment that assists production will tend to be rated at more than this, because the capital equipment produced and used as a measure of input will amount to more than the product of one man-hour of labour in the base year, on account of the increase in productivity in the capital-goods industries in the meanwhile. The same real input will therefore be given a higher or lower measure according to the way it is applied.]

KUHN (A.). Labor: Institutions and Economics. New York: Rinehart, 1956. 9½″. Pp. 616. $6.50.

[This is a comprehensive students' text-book with test questions and suggestions for further reading at the end of each chapter. The first part of the book deals with industrial organisation, institutions and collective bargaining. History and present structure are covered, but main emphasis is on policy, procedure, methods and relationships. Particularly full treatment is given to the theory and practice of collective bargaining and to the legislative provisions which form its background and so largely control its operation in the United States. The second part of the book, dealing with labour economics, is almost equally divided between wages and security of income. With regard to wages the author claims to steer a middle course between proponents of marginal productivity theory and the contentions of the institutionalists. Following this middle course, he reaches the conclusion that the approximate level of wage for a particular type of work within a particular labour market is determined by the marginal net revenue product of that labour in that market—"approximate" meaning within a margin of about plus or minus 33%; that within that range of indeterminacy that actual wage is determined by institutional factors; and that the employer then proceeds to adjust as best he can, by manipulating factors within his control, to the wage so determined by the institutional factors—an adjustment which probably, and particularly for direct production workers doing well-defined operations, brings the marginal net revenue product of the labour into reasonably close equality with the wage.]

LLOYD (E. M. H.). Food and Inflation in the Middle East, 1940–45. Stanford University Food Research Institute, studies on Food, Agriculture and World War II. Stanford, California: Stanford University Press (London: Oxford University Press), 1956. 9½″. Pp. 375. 48*s*.

[To be reviewed.]

MACK (R. P.). Consumption and Business Fluctuations. A case study of the shoe, leather, hide sequence. New York: National Bureau of Economic Research (London: Oxford University Press), 1956. 11½″. Pp. 293. 60*s*.

[To be reviewed.]

MILLS (C. W.). The Power Elite. New York and London: Oxford University Press, 1956. 8½″. Pp. 423. 36*s*.

[To be reviewed.]

MORTON (J. E.). Urban Mortgage Lending: Comparative Markets and Experience. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1956. 9½″. Pp. 187. 32*s*.

[The chief purpose of this study is to summarise and compare the findings of a series of previous National Bureau publications on particular sectors of the urban mortgage market. The author describes the growth in the urban mortgage debt; the increased importance of institutional lenders—insurance companies, banks, mutual savings banks, and savings and loan associations; the role of federal government guarantees; the characteristics of outstanding mortgages; and the lending experience to date. Some of his findings run contrary to commonly held beliefs, and not all of them are entirely comforting. He shows, for example, that the least favourable experience before the war was with those classes of loan that are still predominantly made without the benefit of federal insurance or guarantee—in other words the guarantees are being given chiefly to the sectors of the market that need them least. Another conclusion that emerges clearly, though the exact reasons for it are less clear, is that loans made shortly before a downturn in general activity are more than usually liable to end in default.]

MUMMERY (A. F.) and HOBSON (J. A.). The Physiology of Industry: being an exposure of certain fallacies in existing theories of economics. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8″. Pp. 215. $5.00.

[This is a photographic reprint of the first and best-known of Hobson's works.]

O'NEILL (J. T.). Policy Formation in Railroad Finance. Refinancing the Burlington, 1936–1945. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1956. 9¼″. Pp. 234. 36*s*.

[The purpose of this book is to trace the formation and application of the policy adopted by the Chicago, Burlington and Quincy Railroad to refinance a very large block of bonds maturing in 1994. The author does not seek to assess the merits of the policy, which actually proved very successful, but rather to describe its development in the light of day-to-day decisions. One of the chief factors influencing financial policy was the fear that prospective changes in the capital structure of rival railroads would put them in a stong position in the event of rate competition unless the Burlington's own burden of fixed charges could be reduced.]

OWEN (W.). The Metropolitan Transportation Problem. Washington, D.C.: The Brookings Institution, 1956. 9½″. Pp. 301. $4.50.

[The author analyses the way in which city growth and the increased dependence on private cars have brought about the present transport problem in the largest American cities. Recent experience has seemed to suggest that the demands of the traffic are literally insatiable: in Los Angeles, for example, the tremendously ambitious programme of road-building appears to have achieved little if any reduction in congestion. Much of the author's attention is devoted to the issue between public and private means of transport. In his concluding chapters, Mr. Owen emphasises the need to consider the traffic problem in the broader context of town planning.]

PALMER (G. L.). Philadelphia Workers in a Changing Economy. Industrial Research Department, University of Pennsylvania, Research Studies, No. XXXVIII. Philadelphia, Pennsylvania: University of Pennsylvania Press (London: Oxford University Press), 1956. 9¼″. Pp. 189. 48*s*.

[Since 1921 an extensive programme of research into labour market conditions in Philadelphia has been carried out at the Wharton School of the University of Pennsylvania, and many monographs and articles have been published on the basis of it. The purpose of the present volume is to draw together and place in perspective the findings of the programme as a whole. Dr. Palmer traces the growth of employment in different industries in Philadelphia in the present century and describes the impact of depression and war on the labour market. In a concluding chapter she considers the implications of her findings for those responsible for planning the economic development of cities.]

People, Housing and Rent Control in Buffalo. Report of the Temporary State Housing Rent Commission of New York. New York: Temporary State Housing Rent Commission, 1956. 9″. Pp. 139.

[This is an elaborate study of the present housing situation in Buffalo, with special reference to rented accommodation. Some of the conclusions and methods give the study a more than merely local interest. Although building was very active between 1950 and 1955, the vacancy rate for all dwellings did not rise over the period. At the same time the amount of rented accommodation actually declined. Rent control was lifted from a substantial proportion of rented dwellings during the period, and this makes possible some interesting comparisons between controlled and uncontrolled property. It is found, for example, that the number of persons per room differs by

only a very small amount between controlled and uncontrolled dwellings, and does not differ at all for households of given size. This cannot, however, be taken as a decisive disproof of the doctrine that rent control leads to underoccupation, for a number of reasons which the authors point out. A special feature of Buffalo's housing problem arises from the large recent influx of negroes, who are concentrated in a few areas. The housing standards of the non-white population are kept down not merely by their less than average incomes but also by the large measure of discrimination practised against them by landlords.]

REITZEL (W.), KAPLAN (M. A.) and COBLENZ (C. G.). United States Foreign Policy, 1945–1955. Washington, D.C.: The Brookings Institution, 1956. 9½″. Pp. 535. $4.50.

[Since 1947 the Brookings Institution has published a series of annual studies on current problems of United States foreign policy. The present volume grows out of these studies. It is designed to provide a broader assessment of the reasons underlying the most important policy decisions. While it is thus on a more general level than the Institution's previous publications, the book retains the characteristic approach developed in them. The essence of this approach is that the issues of foreign policy are studied from what is thought to be the angle of the policy makers themselves, who are presented with concrete issues calling for choice between alternative lines of action.]

ROGIN (L.). The Meaning and Validity of Economic Theory. A historical approach. New York: Harper & Brothers (London: Hamish Hamilton), 1956. 8½″. Pp. 697. 52*s*.

[To be reviewed.]

SPENGLER (J. J.) and DUNCAN (O. D.) (Eds.). Population Theory and Policy. Selected readings. Glencoe, Illinois: The Free Press, 1956. 9½″. Pp. ix + 522. $7.50.

[This contains reprints of thirty-eight articles and other readings, chiefly by American authors. The papers are arranged in groups according to subject, and each section is preceded by a brief statement by the editors to provide the framework. The field covered is confined mainly to the more theoretical or general aspects of population movements and their implications, since readings on specific demographic problems have been assembled in a companion volume entitled *Demographic Analysis: Selected Readings*.]

WALKER (K. F.). Industrial Relations in Australia. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1956. 9½″. Pp. xv + 389. 60*s*.

[This book is partly a description and assessment of the Australian system of industrial relations as a whole and partly a more detailed treatment of seven different industries. While the arbitration system forms the background to almost the whole of Australian industrial relations, the author's aim is not, in the main, to deal with the arbitration procedure as such, but to consider the interaction of the parties within an environment of which this forms part. The diversity of experience of industrial relations in the individual industries examined ranges from harmonious and co-operative in furniture manufacturing and metal-mining to hostile and embittered in coal-mining and stevedoring. The author adduces many reasons in the nature, history and organisation of the industries for this differing experience. With one exception, *i.e.*, the pastoral industry, it is in the industries where relations are poorest that the largest role is played by the arbitration system. Of the arbitration system in general the author's main tentative conclusions are that as a means of preventing stoppages of work it has been a failure; that its influence in building constructive and co-operative industrial relations is by no means clear and that it has probably encouraged intransigent and irresponsible attitudes; and that it has accelerated the growth of trade unions and employers' organisations and the establishment of collective bargaining.]

VON WIESER (F.). Natural Value. Edited with a Preface and Analysis by William Smart. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8½″. Pp. 243. $7.50.

[*Natural Value* was one of the earlier of Wieser's major works, being published in 1889. It is an exposition of the Austrian theory of value and distribution, and does not have the sociological slant characteristic of Wieser's later work. The present reprint is a photographic reproduction of the English edition published in 1893 under the editorship of William Smart.]

YOUTSLER (J. S.). Labor's Wage Policies in the Twentieth Century. New York: Twayne Publishers, 1956. 8½″. Pp. 344. $5.00.

[This book summarises the nature of the wage claims made from time to time by American labour, the arguments advanced in support of them and the course of negotiations in regard to them. In addition to a short survey of wage theory and a general account of the policies of the

central workers' organisations, the book includes separate chapters which give a more detailed account of the specific demands put forward in the present century by the trade unions in the clothing, paper, steel, automobile, textile and electrical industries. In these chapters some information is also given about trade-union organisation and the nature and methods of negotiation in the industries concerned. As the author states, " the amorphous mass of material and the length of the period covered in the study " make it difficult for him to present conclusions. The most notable feature which appears to be common to most of the industries examined is the widening, in the war and post-war period, of the nature of claims to include not only straight wage demands but many fringe benefits financed by industry in supplementation of social-security plans.]

ZALEZNIK (A.). Worker Satisfaction and Development. A case study of work and social behavior in a factory group. Boston, Mass.: Graduate School of Business Administration, Harvard University (London: Bailey Bros. & Swinfen), 1956. 8″. Pp. 148. 16*s*.

[This is an interesting addition to the literature on the small group, which the Harvard Business School has done so much to create. The workers in the group studied had widely different backgrounds, and their work was not such as to require a great deal of co-operation. None the less, a fairly clearly developed social structure was found to obtain among them. The evidence leads the author to postulate two hypotheses: first, that a work group will as a rule spontaneously order its relationships so as to achieve a certain minimum level of efficiency on the job and so as to satisfy the social needs of the workers at a level they have been conditioned to expect; secondly, that work groups tend to become " frozen " at this minimum level in the absence of any positive challenge from the leadership.]

German

BOHNSACH (E.). Flüchtlinge und Einheimische in Schleswig-Holstein. Kiel: Institut fur Welwirtschaft an der Universitat Kiel, 1956. 9½″. Pp. 77. DM. 7.0.

[The position of refugees from the Eastern territories is compared with that of the resident population of Schleswig-Holstein by analysing changes in occupation and social status since 1939 on the basis of a sample survey.]

Germany 1945–54. Cologne: Boas International Publishing Company, 1956. (Copies obtainable in England from Messrs. Richard Law, 81 Shaftesbury Avenue, London, W.1.) 12″. Pp. 738.

[This is an elaborate descriptive survey of the West German economy in the style of a gazeteer. It is printed on heavy art paper and profusely illustrated. Well over half of its space is devoted to accounts of the history and present activities of individual business enterprises.]

Dutch

BRAND (W.). Het Streven van de Economisch Onontwikkelde Landen naar een hogere Levensstandard. Leiden: Stenfert Kroese, 1954. 9″. Pp. 240. Dfl.12.0.

[This is a detailed review of the problems of underdeveloped countries. The causes and symptoms of a low standard of living are discussed by examining the specific problems for each factor of production (land, capital, labour and administrative technique in Government and industry). The next chapter treats the availability of internal financial resources and the relation of inflation to development. Finally, foreign investment and the current programmes of international aid are discussed. The author is a member of the United Nations staff, and he evidently has a first-hand knowledge of the problems concerned. Throughout the book examples of actual cases are given in great detail, and the emphasis is on quantitative description and historical and institutional analysis rather than on explanation in terms of a general abstract model.]

Swiss

SCHENKMAN (J.). International Civil Aviation Organization. Geneva: Librairie E. Droz, 1955. 10″. Pp. 410.

[This is a comprehensive study of ICAO, the specialised agency of the United Nations responsible for civil aviation. After an introductory section on the political history of civil aviation and the origins of ICAO, the author describes the structure and working of the organisation and its activities in the technical, economic and legal spheres.]

Norwegian

AUKRUST (O.). Nasjonalregnskap. Teoretiske prinsipper. (National Accounts. Theoretical principles.) Samfunnsökonomiske Studier, 4. Oslo: Statistisk Sentralbyra, 1955. 9½". Pp. 123.

[The purpose of this volume is to explain the theoretical basis of the definitions and tables contained in an earlier publication of the author, entitled "National Accounts 1930–39 and 1946–51." One of the features of the Norwegian approach to the problems of social accounting is that stress is laid on the rigorous distinction between real and financial transactions. The book is in Norwegian, but there is a fifteen-page English summary.]

Finnish

HONKO (J.). Koneen Edullisin Pitoaika ja Investointilaskelmat. (The economic life of a machine and calculations concerning the economics of capital investments.) Helsinki: Liiketaloustieteellinin Tutkimuslaitos, 1955. 9½". Pp. 276.

[This appears to be a useful contribution, considerably dependent upon the recent work of continental capital theorists, to an important subject. A translation of at least the theoretical sections would seem to be worthwhile. The outline of the author's argument, as emerging from the thirty-five-page English summary, is as follows. One of the central problems of capital theory and of applied business economics is to determine the optimum economic life of a durable producer's good such as a machine. In a broader context, this is referred to as the determination of the optimum investment period. Two optimum lives are distinguished: with and without replacement. An initial problem is to decide what is maximised. It is argued that the choice between the two usual rules, maximise internal rate of return and maximise the present value of the stream of net revenues, depends upon the methods of finance—whether there is more or less access to the loan market. The actual analysis of the machine's economic lives is in terms of factors influencing depreciation. This is largely an original approach, although there is reference in the text and in the comprehensive bibliography (which contains U.S., British and continental writers) to the suggestions of Bain and others. The factors considered are: those costs which depend upon the machine's life; demand for the product; technical changes; and prices. There is discussion of the effect of changes in these factors upon the working of existing machines. The work concludes with a detailed study of practical investment calculations, mainly of types evolved in America.]

Israel

THE FALK PROJECT FOR ECONOMIC RESEARCH IN ISRAEL. Second Annual Report, 1955. Jerusalem: The Falk Project for Economic Research (24 Hillel Street), 1956. 9½". Pp. 103.

[This contains a series of outline reports on research findings by staff members. Information is included on eighteen current research projects on Israel's economy, classified under the headings of human resources and economic performance.]

HALEVI (N.). Estimates of Israel's International Transactions, 1952–1954. Jerusalem: Falk Project for Economic Research in Israel, 1956. 9½". Pp. 139. $2.00.

[The author's purpose is to present estimates of Israel's balance of payments which are more detailed and more explicit in treatment of sources and methods than any previously prepared. No attempt is made to interpret the findings. Certain alternative methods are suggested for presenting the balance-of-payments statistics in a way appropriate to Israel's special circumstances, in particular the unique importance of unilateral transfers. On the average of the three years 1952–54, the balance of unilateral transfers to Israel amounted to over half of gross debits incurred on account of imported goods and services.]

Egyptian

MYRDAL (G.). Development and Under-development. A note on the mechanism of national and international economic inequality. National Bank of Egypt Fiftieth Anniversary Commemoration Lectures. Cairo: National Bank of Egypt, 1956. 9½". Pp. 88.

To be reviewed.

Official

BRITISH

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. Domestic Food Consumption and Expenditure, 1954. Annual Report of the National Food Survey Committee. London: H.M. Stationery Office, 1956. 9½". Pp. 89. 5*s*.

[This report is the fifth in its series. It follows the same general lines as its predecessors, with some amplifications. The level of the diet during 1954 is found to have been in practically all respects the highest on record. The full effects of derationing on the structure of demand were not felt till the end of the year, and this topic is therefore given only brief treatment. Despite derationing, class differences in expenditure on food showed some tendency to decline in 1954.]

DUTCH

Scope and Methods of the Central Planning Bureau. The Hague: Central Planning Bureau, 1956. 9½". Pp. 88.

[The techniques of economic planning used in the Netherlands since the War have been the subject of much interest to econometricians and other observers elsewhere. A wide welcome will therefore be given to this exposition of how the Central Planning Bureau does its work. The first part describes the organisation of economic policy-making in the Netherlands and how the Central Planning Bureau fits into the machinery of government. The second and longer part is concerned with the actual techniques of planning, both the drawing up of the yearly plan and the Bureau's rather less well-known work in the sphere of long-term planning. The details of the models currently in use are provided in appendices. Comparisons are also given of forecasts and events.]

INTERNATIONAL

EUROPEAN COAL AND STEEL COMMUNITY. Fourth General Report on the Activities of the Community (April 11, 1955 to April 8, 1956); 9"; Pp. 277. Speech by Monsieur René Mayer, President of the High Authority before the Common Assembly; 8½"; Pp. 50. Strasbourg: European Coal and Steel Community, 1956.

[The report describes the details of the High Authority's activities during the year, while M. Mayer, in his address, considers them in a broader context. The seller's market for coal and steel that prevailed during the year presented certain problems which the High Authority tried to cope with without losing sight of its more long-term objectives. One of the most important developments in the course of the year was the institution of through-rates for fuels and ores on the railways in the countries of the Community.]

INTERNATIONAL LABOUR OFFICE. Production and Employment in the Metal Trades. The problem of regularisation. Geneva: International Labour Office, 1956. 9½". Pp. 121. 7*s*. 6*d*.

[The sources of demand for metal products are classified as goods in process, consumers' durables, producers' durables, government use, inventories and exports. The factors affecting demand and the measures available to stabilise demand are analysed for each of these classes. Other chapters deal with frictional unemployment and the relation between production and employment. The treatment draws on empirical evidence, as well as theoretical considerations, but the authors do not set out to give a systematic survey of the current situation or prospects. While the chief emphasis is on the metal trades as such, it is fully recognised that many of the issues involved in overcoming instability in this industry apply to capital-goods industries generally, and these broader issues accordingly take up much of the space of the report. Its scope is thus so wide that on many aspects of the subject it is not able to go very deep. None the less, it contains much useful material.]

INTERNATIONAL LABOUR OFFICE. Social Aspects of European Economic Co-operation. Report by a group of experts. Geneva: International Labour Office, 1956. 9½". Pp. 179. 9*s*.

[To be reviewed.]

The First Ten Years of the International Monetary Fund. Washington, D.C.: International Monetary Fund, 1956. 11". Pp. 47.

[A survey of the Fund's policy and activities to date. It contains some well-presented information, but its tone is one of official optimism rather than of critical analysis.]

UNITED NATIONS. World Economic Survey, 1955. New York: United Nations, 1956. 11". Pp. 201. 14*s*.

[To be reviewed.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION. The State of Food and Agriculture 1956. Rome: F.A.O., 1956. 11". Pp. 144. 7*s*. 6*d*.

[This report represents a new departure in its series. Only about half of it is devoted to a review of developments during the year, instead of the whole of it, as in former years. In addition, the report contains two special studies, intended to be the first of a series, on particular problems of a more long-term character. The two subjects treated this year are factors influencing the growth of international trade in agricultural products and trends and outlook in world fisheries. Both these studies contain valuable and original work, but the former is naturally of more general interest. It is found that a fairly sharp distinction can be drawn between two classes of agricultural products: those that can be produced in the major industrial countries or else can be replaced by synthetic substitutes and those that cannot. International trade in the second class of products has grown more or less in step with world economic activity as a whole. Until 1930 much the same was true of the first class of products. Since then the volume of international trade in most of these products has actually declined, despite the great increase in world incomes. The report contains much further interesting detail which cannot be briefly summarised.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Yearbook of Food and Agricultural Statistics. Vol. IX, Part 2, 1955. Trade. Rome: F.A.O., 1956. 10½". Pp. 320. 17*s*. 6*d*.

[This contains data on international trade in agricultural products in 1954 and preceding years. Most of the statistics are in physical units, but the first chapter gives summary tables on the values of agricultural commodities and groups of commodities traded.]

UNITED NATIONS TECHNICAL ASSISTANCE COMMITTEE. Eighth Report of the Technical Assistance Board. New York: United Nations, 1956. 11". Pp. 104. 7*s*.

[This contains a detailed record of the progress of the Expanded Programme of Technical Assistance for Economic Development during 1955. Briefer particulars are given of future plans.]

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